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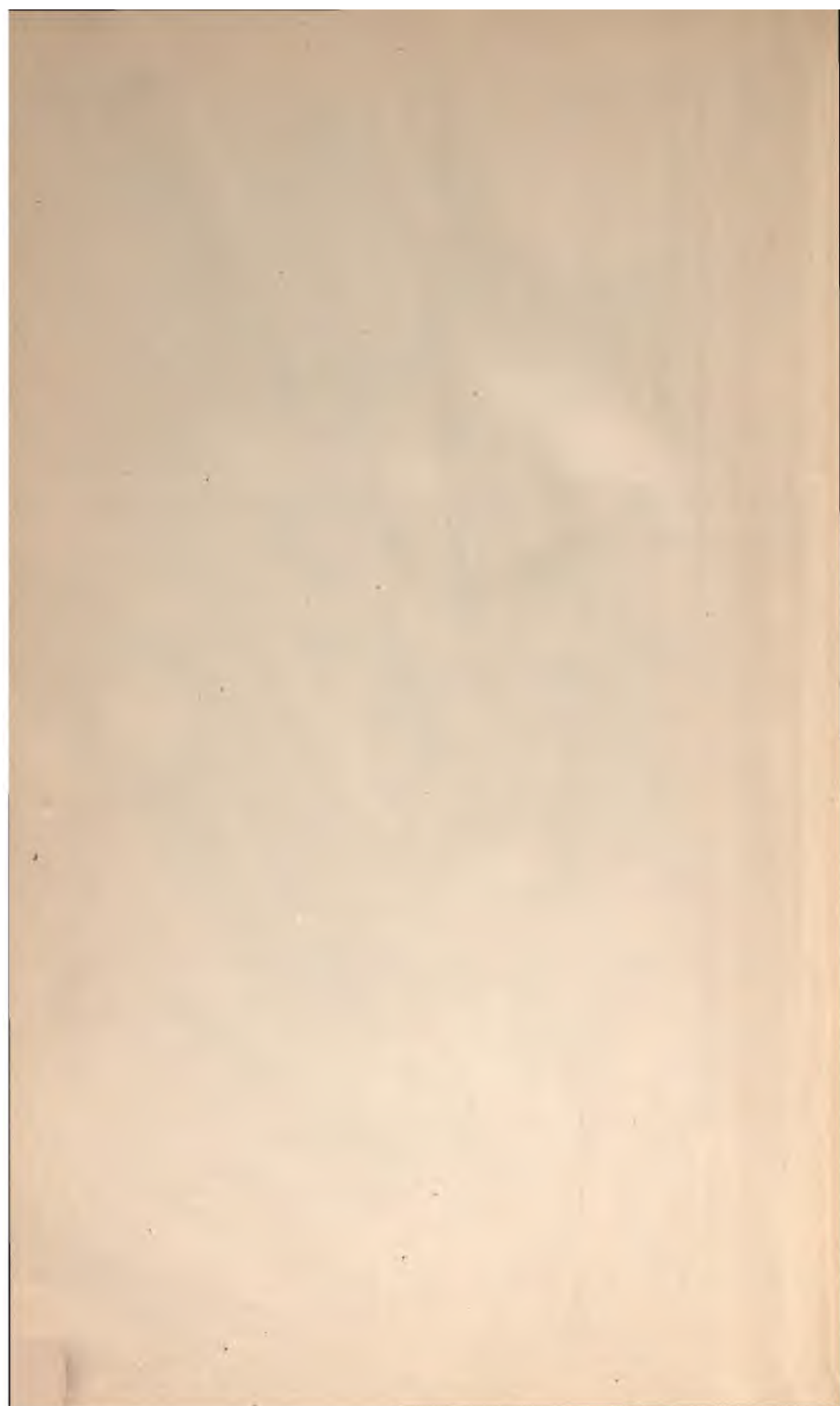


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REPORT
OF THE
OPERATIONS OF THE ENGINEER DEPARTMENT

OF THE
DISTRICT OF COLUMBIA,

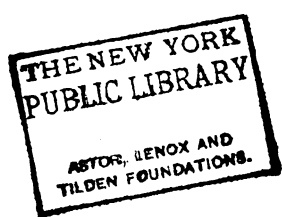
UNDER THE DIRECTION OF

Lieut. Col. HENRY M. ROBERT, Corps of Engineers, U. S. A.,
ENGINEER COMMISSIONER OF THE DISTRICT OF COLUMBIA,

FOR

THE FISCAL YEAR 1889-'90.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1891.



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TILDEN FOUNDATIONS.

Electric Lighting Company. The type of conduit used is the square terra-cotta pipe containing from two to six cells. Congress at its last session provided for the appointment of a board to consider and report upon the subject of subways and conduits, underground cables and aerial wires. This board has since been appointed. A matter of growing importance which might well be called to the attention of this board, and possibly be submitted to it for report, is the wiring of buildings, public and private, for all electrical purposes. The possibility of danger from faulty arrangement or insulation is so great that all electric wiring should be made the subject of regulations, enforced by inspectors appointed for the purpose.

SEWER DIVISION.

The detailed operations of this division are set forth in the report of Acting Superintendent D. E. McComb, which is forwarded herewith.

CLEANING AND REPAIRING SEWERS AND BASINS.

The appropriation for this work was \$35,000. The unprecedented rainfalls of 1889 caused such excessive deposits in the Northwest Boundary, Tiber, Missouri avenue, and B street sewers as to require an unusually large proportion of the appropriation to be spent in cleaning sewers. Several important works of repair were in consequence necessarily deferred until the current fiscal year. During this year it is intended that the trunk sewer on Fourteenth street, northwest, and the principal trunk sewer in Georgetown shall be repaired.

During the coming fiscal year it will be necessary to begin repairing the inverts of many of the old brick sewers, which are beginning to scour out. To defer this work will entail increased expenditures and possible damages.

The estimate for 1892 is \$45,000, which can not safely be diminished.

REPLACING OBSTRUCTED SEWERS.

The appropriation for this purpose in 1890 was \$15,000. Seven thousand two hundred and eighty and three-tenths linear feet of pipe sewer was laid, varying in size from 12 to 24 inches. The replacement of the old pipe sewers goes on steadily, and it is now almost certain that the work can not stop until practically all the pipe sewers laid prior to 1874 have been replaced by those of suitable construction. Twenty-five thousand dollars is estimated as necessary for this work during 1892.

MAIN AND PIPE SEWERS.

The appropriation for this work during 1890 was \$90,000, and there was constructed a total length of 30,873.7 feet of sewers varying in size from 6-inch pipe to the 3.5 by 5.25 feet egg-shaped section. One hundred and three receiving basins were built. The estimate for 1892 is \$119,500, to be expended as follows:

Sewer on H street northeast, between Seventh street east and Florida avenue	\$41,000.00
Sewer on B street northeast, between Eleventh street and Tennessee avenue	3,400.00
Sewer on Fourteenth street southeast, northward from K street	10,000.00
Sewer on Sixth street southeast, between I and K streets	3,000.00
Sewer on C street northwest, between First street and New Jersey avenue	2,100.00
Terra cotta pipe sewers	50,000.00
Receiving basins	10,000.00
Total	119,500.00

SUBURBAN SEWERS.

The appropriation for this purpose for 1890 was \$50,000. The work done embraced 11,654.6 lineal feet of sewers, varying in size from 6 inch pipe to a circular concrete sewer of 7.64 feet diameter. 11 manholes and 6 receiving basins were built.

For 1892 it is estimated there will be required \$112,390, expended as follows:

Sewer in Navy place, between Nichols avenue and the river.....	1
Sewer in Eckington Valley, between Q and R streets	
Sewer on Sherman avenue	
First street west, extended from U street to W street, with branches on V and W streets	
Sewer on Spring road from Piney Branch eastward.....	
Terra cotta pipe sewers	
Rock Creek Valley intercepting sewer (east side), between Lyon's mill and Quarry road.....	
Receiving basins	

Total..... 1

The sewers herein proposed, under both the suburban and permit sewer appropriations, are all urgently needed as extensions to the existing sewerage system, or to relieve existing overcharged sewers.

PERMIT SEWERS.

The allotment for this work was \$35,000, with which there was a total length of 33,605.5 feet of pipe sewer from 6 to 18 inches in diameter and 75 feet of 2.5 by 3.75 feet egg-shaped concrete sewer. Three hundred and ninety-one manholes and 26 receiving basins were authorized under the permit system.

The following work was done at entire cost of applicants: 8 miles of sewer from 8 to 15 inches in diameter, and 16 manholes.

An allotment of \$35,000 is recommended for the year 1892.

A map is appended showing the sewer system as extended under the act of December 1, 1890.

GAUGING SEWERS AND RAINFALL.

Under the appropriation of \$3,000 for the current fiscal year the work is being provided and set, and the areas to be gauged are being carefully measured and plotted. It is expected that valuable results will be obtained during the coming spring and summer.

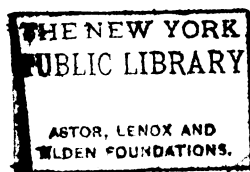
It is highly important that this work should be continued without cessation for several consecutive seasons. It is estimated that the work will be sufficient to carry it on during 1892.

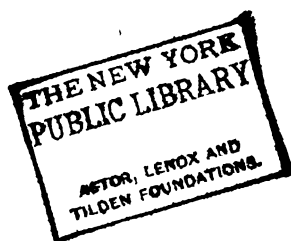
These measurements will have not only a local value in enabling conclusions to be drawn as to the sizes of proposed sewers, but will throw light on the general question of the relation of rainwater discharge to area drained.

SEWAGE DISPOSAL.

A report upon this subject was submitted last February by E. McComb acting superintendent of sewers. This report was submitted to the Engineer Commissioner early in June, 1890, with a discussion of the questions involved and certain general recommendations and conclusions. Both of these reports are herewith appended.

In July last a full and interesting report on the sewerage of the District of Columbia was presented by Messrs. Rudolph Herin Gray, and F. P. Stearns, constituting a board appointed by the



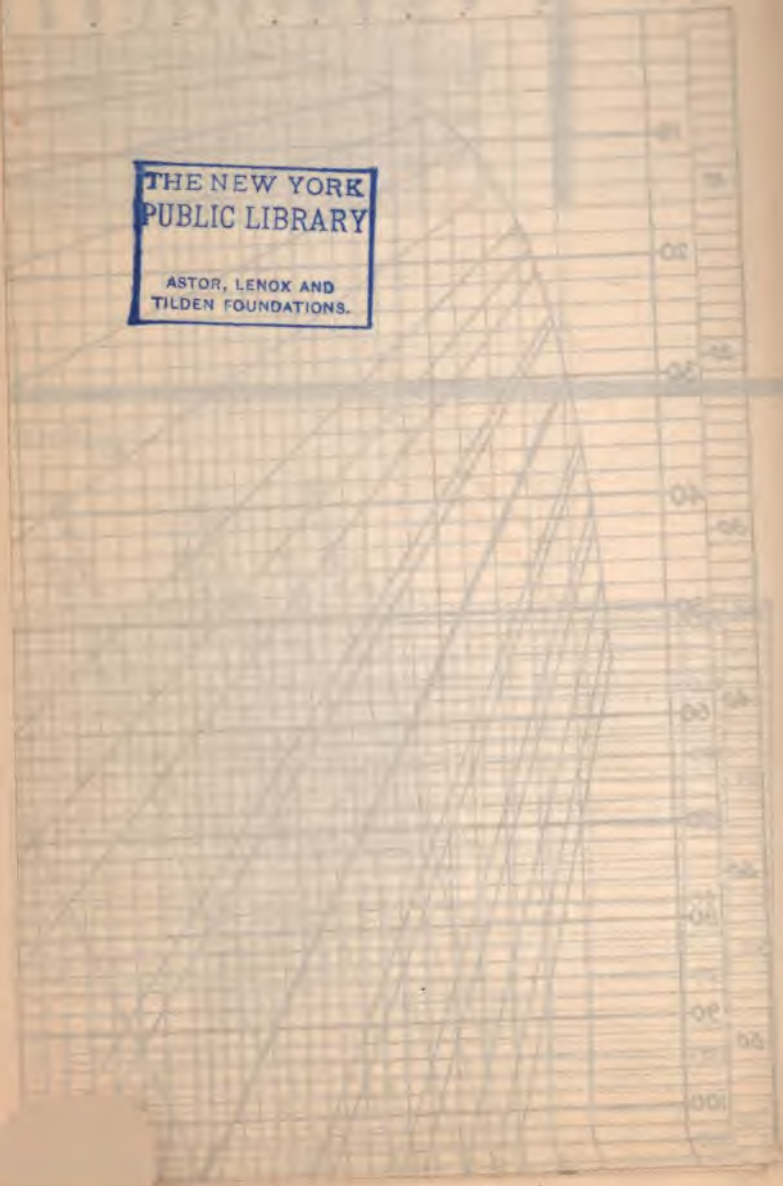


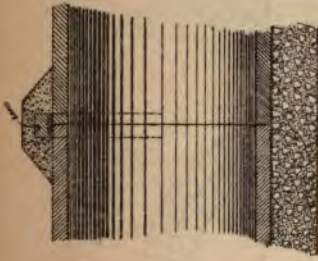
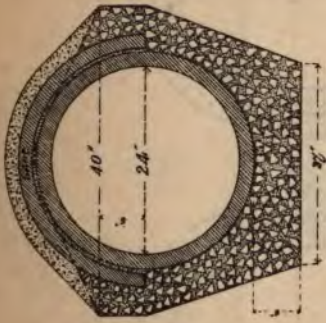
DRAINAGE BY
CONDUITS RUN

Drawings

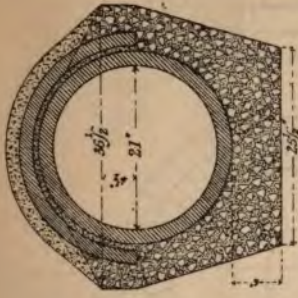
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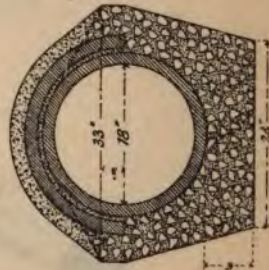


*Long'l. Section at
Joint.*



Sections of Pipe Sewers.

Engineer Dept. D.C. 1890.

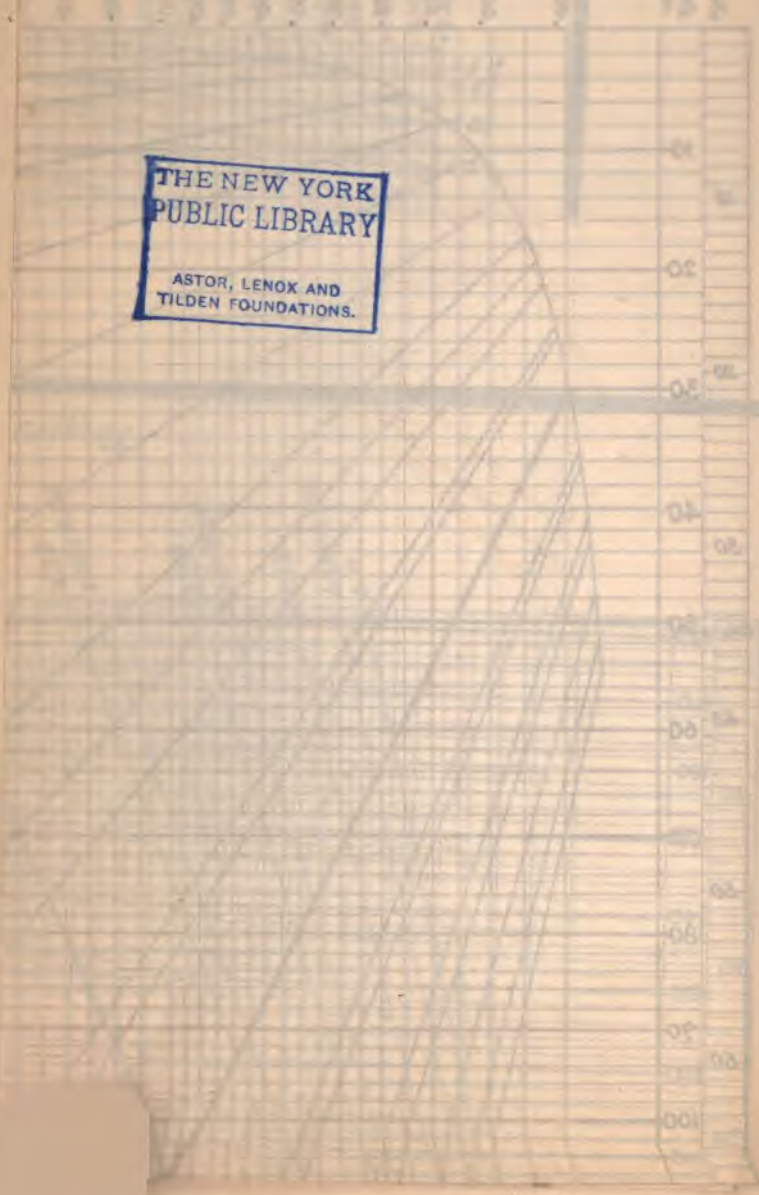


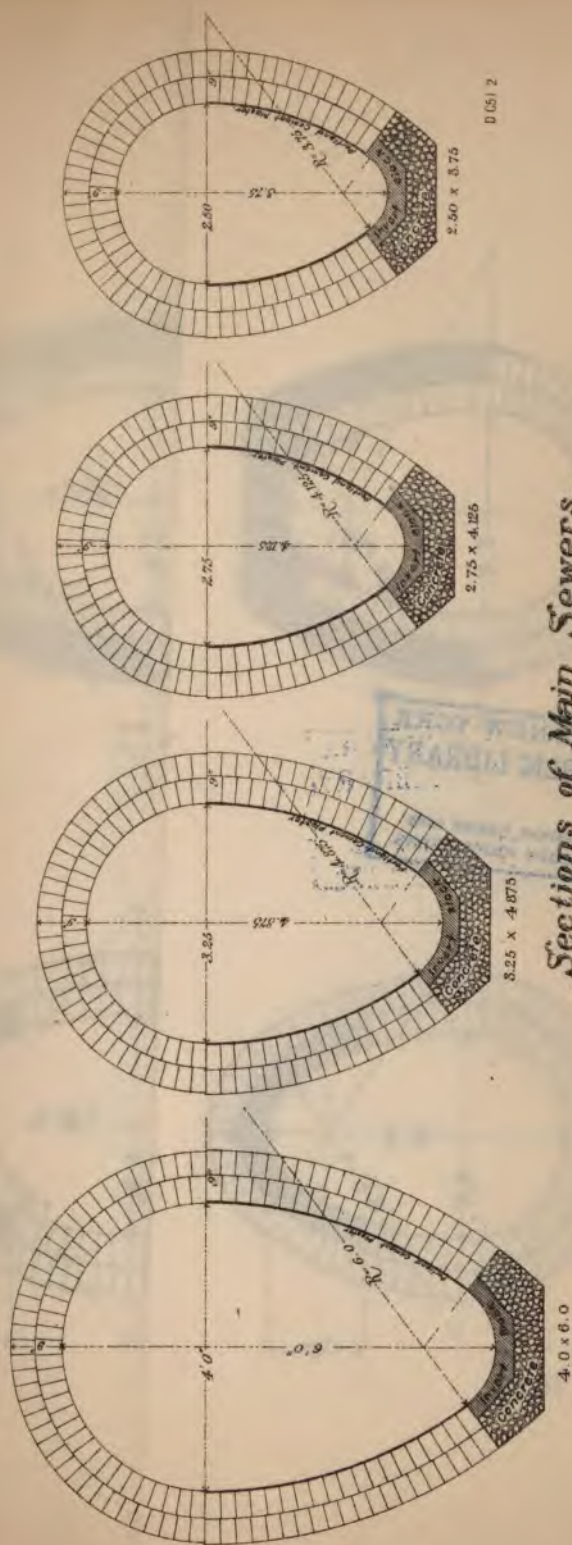
RAINAGE DIA

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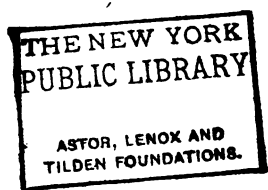
Gradients

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Sections of Main Sewers.



Estimates for improvement of streets, avenues, and roads for year ending June 30, 1892.

SUMMARY.

Georgetown section	\$33,100.00
Northwest section	135,400.00
Northeast section	44,600.00
Southwest section	69,900.00
Southeast section	61,200.00
	<hr/>
Urban streets and roads	344,200.00
	<hr/>
Total	422,200.00

Location.	Improvement.	Estimated cost.
GEORGETOWN.		
Street, from Thirty-fourth to Thirty-fifth	Pave	\$8,500.00
Prospect street, from Thirty-third to High	do	9,000.00
Thirty-sixth street, from Prospect to O	do	7,000.00
Prospect street, from Thirty-fifth to Thirty-sixth	do	4,000.00
Street, from Thirty-fifth to Thirty-sixth	do	4,000.00
Total		<hr/> 33,100.00 <hr/>
NORTHWEST.		
North Capitol street (west side), from K to M	Pave	\$10,000.00
Thirteenth street, from New Hampshire avenue to S	do	8,000.00
Thirteenth street, from T to Florida avenue	do	24,000.00
Street, from Fourteenth to Sixteenth	do	14,000.00
Street, from New Hampshire avenue to Twentieth	do	13,000.00
Street, from Seventeenth to Eighteenth	do	10,000.00
Thirteenth street, from D to E	do	6,500.00
Street, from Ninth to Tenth	do	7,500.00
Street, from Twenty-second to Twenty-fourth	do	11,000.00
Coline street, from Fifteenth to Sixteenth	do	5,500.00
Florida avenue, from First to Fourth	Grade and regulate	10,900.00
New York avenue, from Thirteenth to Fourteenth	Remove parking	8,000.00
Thirteenth street, from S to T	do	7,000.00
Total		<hr/> 135,400.00 <hr/>
NORTHEAST.		
Fourth street from C to D	Pave	\$2,600.00
Fourth street from C to D	do	2,500.00
North Capitol street from K to M	do	10,000.00
Florida avenue from Bladensburg road to Ninth	Grade and regulate	20,500.00
First street from F to H	Pave	10,300.00
Massachusetts avenue from North Capitol to First	do	14,000.00
Street from Eighth to Tenth	do	5,000.00
North side Lincoln Square	Grade and regulate	5,000.00
Total		<hr/> 69,900.00 <hr/>
SOUTHWEST.		
Street from Four and a-half to Sixth	Granite blocks	7,600.00
Street from Seventh to Thirteenth	Pave	27,000.00
Second street from Maryland avenue to C	do	} 10,000.00
Second street from E to F	do	
Total		<hr/> 44,600.00 <hr/>
SOUTHEAST.		
Thirteenth street from D to Pennsylvania avenue	Asphalt blocks	1,800.00
Thirteenth street from D to Pennsylvania avenue	Grade and regulate	6,000.00
Pennsylvania avenue from Eleventh to New Bridge	Sidewalk and parking	2,500.00
Seventh street from East Capitol to C	Granite blocks	20,000.00
North side) street from Ninth to Pennsylvania avenue	Asphalt blocks	5,000.00
North Carolina avenue from Eighth to Eleventh	do	20,000.00
Street from Second to Third	Grade and regulate	2,600.00
Second street from I to Virginia avenue	do	3,300.00
Total		<hr/> 61,200.00 <hr/>

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RAINFALL

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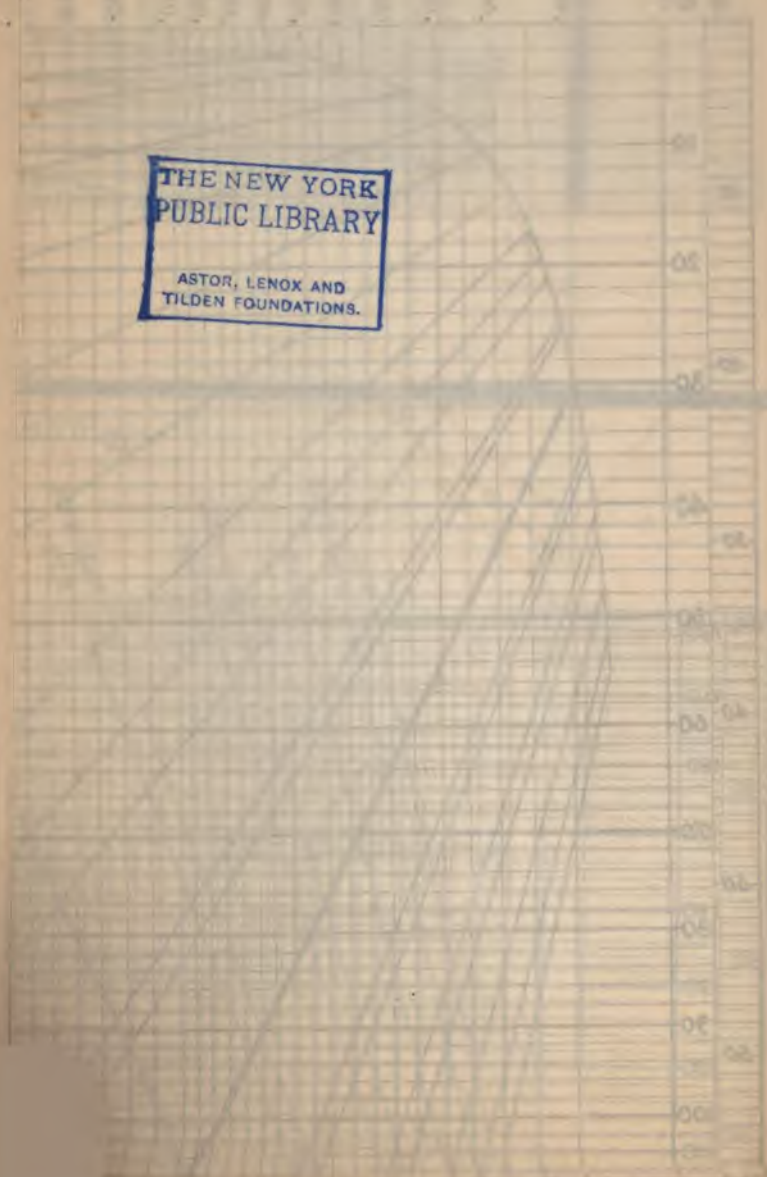


BRIDGE DIA

CONDUITS RUN

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ork. While the immediate demands of the engineer department can be satisfied by the use of blue print copies of the original sheets, such method of reproduction is utterly inadequate to supply the results of this elaborate survey to the many who would be greatly benefited thereby. As this will be completed during the current fiscal year, I could earnestly recommend that steps be taken to secure its publication in full at the earliest possible day. The production of an accurate model of the District in plaster would also be extremely desirable, and if the survey were thus represented with such a degree of precision as could be quite possible it would possess a utility in planning improvements and developments of the District which is difficult to realize in a map.

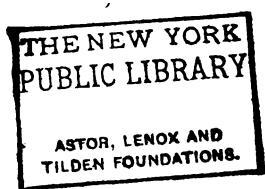
The subject of the proper plane of reference for the bench marks established during the progress of the work is one of great importance, and in January, 1890, Assistant Hodgkins was directed to run additional lines of level to connect the bench marks of the District survey with those determined by the tidal observations of the Coast Survey and others. This led to an investigation of the origin of the system of levels in use in the District, and a report upon this subject was made to the superintendent January 22, 1890.

From this it appears that the levels used in the engineering work and in the survey of the District depend upon a (probable) *assumed* "high water," and date back at least to 1797. It is very desirable that additional tidal observations should be obtained to determine the absolute elevation.

The party of Mr. Hodgkins was also employed in March in the determination of the distances separating several points on opposite sides of the Anacostia River by means of a system of triangulation.

The establishment of permanent monuments in the District outside of the present city limits for points of reference to indicate the exact lines of such streets and avenues as it may be found expedient to produce upon their present alignments or extend upon any other system that necessity or prevailing conditions may suggest is a subject to which attention has been given in the past year by the committees in Congress and by the Engineer officer in charge of street improvements. It having been intimated that the Coast and Geodetic Survey might be charged with the location of these monuments, and the matter being one of much importance, I requested Assistant J. W. Donn, one of the most experienced topographers in the service, who has long been connected with the District work and who thoroughly understands existing conditions, to make a brief report upon the possibility of any general extension along established lines and also upon a plan for such establishment of street intersection monuments as would be practical and result in the accomplishment of the desired object expeditiously and with reasonable economy.

Mr. Donn submits his opinion that a general extension of the streets and the avenues of the city, in accordance with the present plan, is practicable only by a most extravagant expenditure of money, the topographical conditions being, for the most part, unfavorable for economic grading. While a part of the District, to the east of the extension of Sixteenth street, is not altogether unfavorable to the continuation of the rectangular system, that part west of the same line can only be so developed through an enormous expenditure of money and the destruction of most of those picturesque features that now add materially to the attractiveness of the suburbs of the capital. In the eastern or more favorable portion he notes that extensions have



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Estimates for improvement of streets, avenues, and roads, etc.—Continued.

Location.	Improvement.	Estimated cost.
SUBURBAN.		
Brightwood avenue	Granite blocks	\$20,000.00
Fourteenth street extended	Asphalt	15,000.00
Fourth street extended northeast	Grading	5,000.00
Linden street, paving through LeDroit Park	Asphalt	8,000.00
Linden street to College	Grade and regulate	8,000.00
Bunker Hill road from Queens Chapel road to District line	Graveling	4,000.00
Rock Creek Church road	Grade and regulate	4,000.00
Fillmore Street (Anacostia) between Harrison and Jefferson	do	2,000.00
Pierce street (Anacostia) between Harrison and Jefferson	do	2,000.00
Naylor road	Grade and macadamize,	3,000.00
Nichols avenue	Granite block	7,000.00
Total		78,000.00

TOPOGRAPHIC SURVEY OF THE DISTRICT OF COLUMBIA.

U. S. COAST AND GEODETIC SURVEY,
OFFICE OF THE SUPERINTENDENT,
Washington, D. C., November 22, 1890.

SIR: I have the honor to submit herewith the annual report relating to the topographic survey of the District of Columbia. The statistics of the work may be briefly given as follows:

1. Stones for permanent bench marks planted	77
2. Bench marks (permanent) on other objects	124
3. Miles of standard lines of levels run	88
4. Acres of topography surveyed during the year	5,671
5. Cost of topography on account of District of Columbia appropriation	\$9,965.24
6. Cost of topography per acre, exclusive of salaries of chiefs of parties	\$1.514
7. Cost of topography per acre on account of salaries of chiefs of parties (average)	\$0.204
8. Total cost of topography per acre, including salaries of chiefs of parties	\$2.32
9. Days lost on account of bad weather, all parties combined	146
10. Days during which work was executed in the field, including all the parties	562
11. Days in which other operations than topography was executed in the field, by all the parties	120
12. Days lost on account of Sundays and legal holidays, by all the parties	159

It will be seen that the cost of the work per acre is considerably less than for the previous year, this being due to the now favorable nature of the area worked over. Near the end of the fiscal year, however, scarcely anything remained except wooded areas and it was deemed advisable to increase the working force by the addition of another party in charge of Assistant J. W. Donn, in order to utilize the few weeks remaining before the leaves on the trees would effectually prevent work. By this means the appropriation for the year was expended more economically and, with the exception of the party in charge of Mr. Wainwright, who was working on more favorable ground, all operations closed about the 1st of June. The season was thus shorter than in previous years and the weather even more unfavorable, as is shown by the fact that a total of 146 days was lost on account of bad weather, against 147 during the longer season of the last fiscal year. No publication of any portion of the work has been attempted this year, either by photolithograph or otherwise, it being thought more desirable to expend the appropriation entirely in the direction of completing the

work. While the immediate demands of the engineer department can be satisfied by the use of blue print copies of the original sheets, such a method of reproduction is utterly inadequate to supply the results of this elaborate survey to the many who would be greatly benefited thereby. As this will be completed during the current fiscal year, I would earnestly recommend that steps be taken to secure its publication in full at the earliest possible day. The production of an accurate model of the District in plaster would also be extremely desirable, and if the survey were thus represented with such a degree of precision as would be quite possible it would possess a utility in planning improvements and developments of the District which is difficult to realize in a map.

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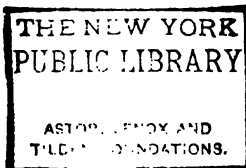
already been made in which the original lines of development of the city have not always been regarded.

In reference to the establishment of monuments for the use of engineers in the development of this area, he suggests that it seems probable that two of the principal streets may be extended in straight lines to the District boundary, Sixteenth street and North Capitol street, and that suitable stones should be placed on the lines of these extensions at distances of one-half mile. The exact positions of these monuments may be fixed by means of a single scheme of plane triangles, and the positions of the milestones in the southeast, northeast, and northwest boundary lines should be determined in the same manner. These with the already existing large number of well marked triangulation points will, in his judgment, furnish such standards of position and distance as will enable the city engineer to lay out any order or arrangement of streets and avenues that may finally be adopted by the constituted authorities and to establish at short notice any line or point that public want or private enterprise may require. As it is quite probable that on the completion of the topographic survey now on hand there will remain a sufficient sum out of the present appropriation to accomplish such a scheme, I respectfully invite your attention to the suggestions offered above.

One of the most important operations of the year, in my judgment, although costing relatively little in time or money, was an inspection of portions of the work and a test as to its character and accuracy. Of all the various operations of the surveyor, topography possesses in a less degree than any other internal evidence of its own integrity. The outcome of a topographical survey is usually a chart or map, which is often more a testimonial to the skill of the draughtsman and engraver than a guarantee of faithful and painstaking work on the part of the surveyor. Or the surveyor himself may be something of an artist and may thus be able to make what is really a poor piece of work far more presentable than his colleague whose skill lies in the direction of precision in performance rather than pictorial art. If topographical surveys are properly and honestly made their nature is very accurately represented by their cost, but a very cheap and a very poor piece of work may be wrought into a very handsome map.

To say, therefore, that a certain piece of topography cost \$5 a square mile and another \$1,000 a square mile means little or nothing, unless it is known that both were made by men equally well trained in their profession and equally honest and conscientious in the performance of their duties; and under such conditions it means that the relative value of the two products is fairly represented in their relative cost.

Although there was no reason to believe that work done in the District during the several years in which the survey has been in operation was any other than of the highest character, yet, in view of its cost, compared with much topographical work executed by the Coast and Geodetic Survey, as well as by other parties in Government service, I thought it desirable to anticipate any criticism which might arise by "instituting such an inspection and test as would reveal any weakness which might exist." As a matter of fact the plan under which the survey is being executed is such as furnishes constantly checks upon its accuracy, growing out of the fact that several independent parties are employed, and the junction of any two sheets, produced independently and often considerably separated in time, affords a severe test of the integrity of both parties. In addition to this, however, a resurvey of a small part of one of the most difficult areas, including parts of two



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TILDEN FOUNDATIONS.

heets independently made by two surveyors, was undertaken at my direction by Assistant Donn, whose skill as a topographer is everywhere acknowledged. This special survey comprised an area of 112 acres, and was executed in February and March. As an additional test Mr. Donn was also directed to run a line of levels which should include sheets of at least two parties, and from this a profile was plotted which might be compared with that based on the contour lines of the regular survey. This line was one varying greatly in elevation and was one mile and one-sixth in length. Tracing of the resurvey and of the profiles thus prepared were made so that a comparison could be quickly and easily made by superposing one upon the other.

The results of this examination were extremely satisfactory. The two sets of contour lines are almost exactly identical, the agreement being remarkable for two independent surveys in which the contouring is as close as 5 feet. The extremely close agreement of the profile lines demonstrates the fact that for nearly all practical purposes the survey furnishes the equivalent of an infinite number of lines of level, and it is not too much to say that the gentlemen in charge of the several parties in the execution of this work deserve to be congratulated on its high quality as thus revealed.

Those portions of the District remaining unsurveyed at the end of the fiscal year are shown on a tracing submitted herewith. The work will be completed during the coming season, and when done the District will be in possession of a topographical survey which in minuteness of detail and accuracy of execution has no parallel in this country and few, if any, rivals elsewhere.

Messrs. Wainwright, Hodgkins, and Flemer were in charge of parties during the whole and Mr. Donn for a small part of the season. It is hardly necessary to say, after the remarks already made, that they have shown good judgment, skill, and great industry in the prosecution of the work.

Respectfully, yours,

T. C. MENDENHALL,
Superintendent.

Col. H. M. ROBERT,
Engineer Commissioner, District of Columbia.

REPORT OF THE SUPERINTENDENT OF STREETS.

OFFICE OF THE SUPERINTENDENT OF STREETS,
Washington, D. C., October 1, 1890.

COLONEL: I have the honor to submit the following report of the operations of this office for the fiscal year ending June 30, 1890.

The appropriation for current repairs to streets, avenues, and alleys was \$40,000, the entire amount of which was expended in the manner as shown by table marked A.

In executing this class of work, the police and health departments have reported more than 1,400 dangerous holes in sidewalks, carriageways, and alleys, making 271 foremen's orders for repairs. There have also been given 423 foremen's orders for general work of repairs, beside the regulation of the public dump at Nineteenth and B streets, northwest.

A.—Work done under appropriation for current repairs to streets, avenues, and alleys from July 1, 1889, to June 30, 1890:

Grading	cubic yards..	14,204
Flag laid	linear feet..	33,350
Curb set	do.....	6,427
Cobble paved	square yards..	43,362
Brick paved	do.....	16,994
Asphalt tile paved	do.....	275
Asphalt block paved	do.....	1,206
Granite block paved	do.....	5,230
Cement block paved	do.....	147
Vitrified brick paved	do.....	363
Unclassified work	cost ..	\$2,383.81
Material	do.....	6,102.58
Labor	do.....	23,834.51
Miscellaneous labor	do.....	4,203.87
Foremen's labor	do.....	3,466.23
Total cost		40,000.00

The act of Congress approved March 2, 1889, appropriates \$125,000 for permit work, \$90,000 of which was allotted to the street department. The act provides that under the permit system, "the property owners requesting such improvements shall pay one-half of the total cost." The expenditures under such provision were \$25,325.65 as shown by statement marked B.

B.—Summary of permit work ordered and completed from July 1, 1889, to June 30, 1890—

No.	For whom done.	Grading.	Asphalt block.	Asphalt tile.	Brick.	Vitrified brick.	Cobble.	Curb.	Flag.	Artificial stone.	Sheet asphalt.	Amount.
		C. yd.	sq. yd.	sq. yd.	sq. yd.	sq. yd.	sq. yd.	L. ft.	L. ft.	sq. yd.	sq. yd.	
1	P. B. Dunn	108			18			7				\$284.00
2	H. K. Simpson				77			12				61.00
3	J. L. Weaver et al.				256				50			369.44
4	V. Anderson	13			100							78.00
5	G. A. McIlhenney			64								111.00
6	B. H. Warner & Co.	200					535					228.00
7	Samuel Fowler			100								186.00
8	J. C. McGuire				132		4		39			108.00
9	H. King, jr.	35			103							77.00
10	E. F. Riggs	616			718		348		233			891.00
11	T. F. Schneider	246			724			10				577.00
12	F. J. Augusterfer			47								100.00
13	Wm. Wittfalt				45			12				35.00
14	W. J. Acker	42					83		75			52.11
15	G. J. Mueller						51		46			14.00
16	D. B. Groff	20			210		75		220			180.00
17	W. C. Hill	142					191	573	350			440.00
18	Antick Palmer			61								101.50
19	M. W. Galt			20								38.12
20	S. J. Neenan			31								57.07

ry of permit work ordered and completed from July 1, 1889, to June 30, 1890—
Continued.

whom done.	Grading.	Asphalt block.	Asphalt tile.	Brick.	Vitrified brick.	Cobble.	Curb.	Flag.	Artificial stone.	Sheet asphalt.	Amount.
	C. yd.	sq. yd.	sq. yd.	sq. yd.	sq. yd.	sq. yd.	L. ft.	L. ft.	sq. yd.	sq. yd.	
skling.....		223									\$390.57
ilverick.....		52									99.98
ekling.....		29									52.62
of the Cove.....									375		621.47
Iay.....				95							58.08
all.....	12			49							36.04
hittmore.....			169				10				313.61
eux.....			224								366.50
shop.....			22	4							40.62
n.....				72							52.05
Baker.....				41							26.66
neider.....	1,472	879									3,422.96
ady.....	8		40	2							66.28
Kengla & Co.....				40							28.44
llins.....	115			278		115	160	265			291.36
shau.....	110			109		38	134	149			122.80
roff.....	100	248					30				600.40
arner & Co.....			378								594.85
ing.....	63				125		17				200.99
on et al.....		522									1,207.86
ly.....			38								66.04
mer.....			35								61.99
& Platt.....				102							123.45
ill.....		20	295				144				528.06
ickenbush.....	20			118							84.21
artin.....	15			202							56.05
Emmons.....	24				37						63.27
man.....			112								112.74
man.....				97							74.06
ing.....				117			100	100			107.49
Emmons.....	26				62						104.19
Bishop.....			31								56.96
ardt.....			278								449.95
Maddox.....			112								112.75
C. Peet.....			22								40.55
arner & Co.....				232			75				176.01
nuan.....				18							37.64
illips.....				112							88.60
less.....				243							173.45
schmidt.....			20								35.28
ant.....				500		172	517	517			592.62
ewtoa et al.....							175		170		285.55
de Sands.....				246							154.75
lbrook.....	886			570		285		855			636.92
less.....	20			81			41				147.16
King.....			32								58.29
de Sands.....				232							166.70
ook et al.....	48			214							203.85
ector.....				100							49.97
aggamann.....	305			616		236	588	595			670.81
Broos.....			34								57.98
Star News- Company.....							160				741.56
O'Dea.....				40							20.82
Johnson.....				61							51.87
Early.....	2,000			1,195		537					1,607.90
ity.....					16						38.51
s.....							360				49.61
own.....	12			52							53.94
gner.....			24								55.04
ields.....	70			115		30	158	160			155.61
s.....				19							34.89
Rutherford.....			408				210				740.32
Brien.....				27							20.46
lton et al.....	330			1,149		426	1,209				2,591.80
& Liebermann.....									296		699.69
Douglass.....				92							154.14
yer.....											145.32
total.....	6,950	1,777	3,012	9,578	240	3,126	4,702	3,654	545	206	25,325.65

ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA.

provides:

Commissioners of the District of Columbia are authorized, in their discretion, to order the above-enumerated work as in their opinion is necessary for the safety, or comfort, and to pay the total cost of such work from the special fund; one-half the cost of such work so done, including material and labor, to be charged against and become a lien upon the property abutting upon the improvement, etc.

Under this provision the expenditures have been \$46,151.27, as shown by statement.

Compulsory permit work ordered and completed from July 1, 1889, to July 30, 1890.

	Grating.	Asphalt block.	Asphalt tile.	Brick.	Vitrified brick.	Cobble.	Granite block.	Curb.	Flag.	Cement block.	Sheet asphalt.	Total.
	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.			
Alley, square 749	2,300					1,652		48	1,530			81
Alley, square 84					185							
Alley, square 368	190	193										
Alley, square 543	1,136					1,710			725			
Alley, square 368	100					76			69			
Alley, square 76	585	1,530										2
Alley, square 725		1,480										3
Alley, square 475	211	375										1
Alley, square 442	362	818										2
Alley, square 387	1,200				1,768							2
Alley, square 279		232										
Alley, square 207	676	740										1
Alley, square 157		322										
Sidewalk, west side Fifth, between H and I, NE	4			329								
Sidewalk, Princeton street, Thirteenth to Fourteenth, NW	300			383								
Sidewalk, B street, between First and Second, SE			725	98				119				1
Sidewalk, west side Thirteenth street, between D and E, SE				257								
Alley, square 93	263	645										1
Sidewalk, Twelfth street, between G and H, SE	176			366		122						
Sidewalk, Corcoran street from Thirteenth to Fourteenth				319				48				
Sidewalk, NE corner Fifth, I, and Massachusetts avenue, NW				227								
Sidewalk, south side Pennsylvania avenue, between Sixth and Seventh, SE			148					63				1
Sidewalk, 601 to 637 Massachusetts avenue, NW				387								
Sidewalk, SE corner Tenth and P streets, NW				139								
Alley, square 676	441				400							
Alley, square 226	155					458		57				1
Alley, square 409	192				504			30				
Alley, square 1020	895				1,074							1
Sidewalk, lot 47, square 30				51			4	36				
Alley, square 620	98					135		140				
Sidewalk, south side Water street, near K				62				35				
Sidewalk, Ninth street, from Pennsylvania avenue to New York avenue, NW			2,349							250		2
Sidewalk, Thirty-second and Q streets, NW				330				35				

Summary of compulsory permit work ordered and completed, etc.—Continued.

Location.	Grading.	Asphalt block.	Asphalt tile	Brick.	Vitrified brick.	Cobble.	Granite block.	Curb.	Flag.	Cement block.	Sheet asphalt.	Total cost.
	<i>Cu.</i> <i>yds.</i>	<i>Sq.</i> <i>yds.</i>	<i>Sq.</i> <i>yds.</i>	<i>Sq.</i> <i>yds.</i>	<i>Sq.</i> <i>yds.</i>	<i>Sq.</i> <i>yds.</i>	<i>Sq.</i> <i>yds.</i>	<i>Lm.</i> <i>lf.</i>	<i>Lm.</i> <i>lf.</i>			
k. Sixth street, on E and F, SW square 276	252		312	47				6	275			\$432.87 89.50
k. 1417 and 1419 street, NW square 168	89			44	196							9.16 227.87
k. Pennsylvania e. between Ninth and Tenth streets, NW			143									245.33
k. First street, on Pennsylvania and Tenth avenues,				53			2	250			838	1,075.92
k. Sixth street, on D and E, SW				12			14	415			520	661.80
k. 3244 Water to alley west				144								53.79
k. Virginia ave- between Sixth and Tenth, SW				432					70			96.79
k. 945 O street, on Tenth and Eleventh, NW				52								30.95
k. Seventh street, on N and O, NW			534					110				849.43
k. New Ham- mon Avenue, from Tenth to Eleventh avenue, NW				320				23				78.40
k. Pennsylvania e. between Third and Fourth, SE			690									1,047.59
k. H street, be- tween Thirteenth and Tenth, NW				449				15				72.47
square 801	490				573							1,061.29
k. Seventh street, on E and F, SW				209				30				44.94
k. Maryland ave- between Eleventh and Twelfth, SW				521				100				104.86
k. Q street, be- tween Seventeenth and Eighteenth, NW				444				48				90.66
k. Virginia ave- between Fourth and Fifth, SW				160				20				43.92
k. Third street, on B and C, SE				179								85.74
k. D street, be- tween Ninth and Tenth, NW				168				42				260.78
k. P street, be- tween North Capitol and First, NE	50			536								393.45
square 809	183				318							544.70
k. 1014 K street, on Tenth and Eleventh, NW				166								83.23
k. 1612 Rhode Island Avenue, NW				108								18.22
k. Louisiana ave- between Ninth and Tenth, NW					1,191							1,806.95
k. 1002-4-6 K street, NW				80								18.34
k. Thirty-second P to Q, NW				541				12				212.99
k. Twentieth M to N, NW				254								146.36
k. P street, Twen- ty-first to Twen- ty-second, NW				391								218.96
k. 1341 and 1321 Hampshire ave- nue, NW				48								87.77

C.—Summary of compulsory permit work ordered and completed, etc.—Continued.

No.	Location.	Grading.	Asphalt block.	Asphalt tile.	Brick.	Vitrified brick.	Cobble.	Granite block.	Curb.	Flag.	Cement block.	Sheet asphalt.	Total cost.
		Cu. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Lin. ft.	Lin. ft.			
72	Sidewalk, Fourteenth street, Pennsylvania avenue to New York avenue, NW								110		544		\$878.15
73	Alley, square 719	108				256							411.18
74	Alley, square 358		1,050						144				2,670.11
75	Alley, square 676	250				2,700							4,267.10
76	Alley, square 376	40				639							954.03
77	Alley, square 926	353				416							836.21
78	Alley, square 194	480				561							1,058.03
80	Alley, square 585	891				673							2,411.81
81	Alley, square 877	1,107				1,329							2,449.42
82	Alley, square 363	350				907							1,817.46
83	Alley, square 534	20				111							191.36
84	Alley, square 990	1,063				1,860			20				3,016.70
85	Alley, square 395	110	740										1,641.85
86	Alley, square 680	160				511							1,005.55
87	Alley, square 589					825				20			1,218.95
88	Sidewalk, Thirty-fourth street, between S and T, NW	245			163								177.79
89	Sidewalk, F street, Ninth to Fourteenth, NW			2,050									3,228.31
90	Alley, square 179	600	690										1,777.81
91	Alley, square 207	1,400	2,345										5,725.22
92	Alley, square 155	640	952										2,532.08
93	Sidewalk, Seventh street, Pennsylvania avenue to Florida avenue, NW			526									825.95
94	Sidewalk, Fourteenth street, F to G, NW			533									841.12
95	Sidewalk, corner Tenth and F, NW								22		76		130.86
96	Alley, square 179	613	720										1,847.72
97	Sidewalk, Seventh street, Pennsylvania avenue to Florida avenue, NW			294									471.87
Total		18,728	12,832	8,520	8,262	17,093	3,095	484	2,056	2,611	1,987	1,367	86,151.27

marked D gives the amount of work done for parties ordering the construction of ways and other pieces of work that were needed for their sole benefit and not for the general public, which amounts to \$9,021.57.

done for parties paying total cost of same from July 1, 1889, to June 30, 1890.

Name.	Location.	Asphalt block.	Granite block.	Asphalt tile.	Vitrified brick.	Paving brick.	Curb.	Flag.	Amount.
		s. yd.	s. yd.	s. yd.	s. yd.	l. ft.	l. ft.		
Simpson.....	640 Pennsylvania ave. SE.....	18	12						\$49.37
edy Bros.....	H st., between North Capitol and First.....	12							51.37
hington Gas- t Co.....	Seventh st. F SW. to Boundary.....								1,423.78
Jackson & Co.....	Fourteenth st. SW.....	52			18	45			145.01
Diendonne.....	111 B st NE.....	10							15.50
Wood.....	B st., between First and Second SE.....	10							28.09
Corcoran.....	1503 L st. NW.....				12	8			3.10
Baker.....	1005 B st. NW.....	20							47.19
bia Railroad Co.....	New York ave. NW.....	350							937.36
Groff.....	718 to 730 Fourth st. NE.....				24				17.99
rtin.....	1315 to 1323 Thirty-fifth st. NW.....				14				10.29
Baker.....	1115, 1117 Tenth st. NW.....				40				6.28
el Carson.....	122 G st. NE.....	12							30.32
Lambert.....	924 Pennsylvania ave. NW.....			8					17.60
ington Safe De- it Co.....	916, 918 Pennsylvania ave. NW.....	20							70.10
at Getz & Son.....	1208 Potomac st. NW.....				33				25.80
Homiller.....	Thirty-fifth st., between N and O NW.....				14	10			10.67
c Phaeton Co.....	C st., between Tenth and Eleventh SE.....	55							124.61
M. Ryon.....	41 G st. NW.....				9	8			15.87
McIntyre.....	Twenty-sixth and K sts. NW.....				11	10			23.19
iley.....	Cor. Third and Indiana ave. NW.....				11	8			19.75
Beall.....	Q st., between Thirty-third and Thirty-fourth.....				153				143.09
s & Weaver.....	Fenton st. NE.....					365			179.02
Chase.....	Cor. Third and N sts. SE.....				8				13.40
G R. R. Co.....	Seventh st., B north to B south.....								3,072.98
Galt & Co.....	D st., between First and Second NW.....	20				10			55.24
Edson.....	Alley sq. 181.....	5							8.88
West & Bro.....	1741 Johnson ave. NW.....				12	10			21.82
k Palmer.....	Fourteenth and Chapin sts.....			40					40.95
Phillips.....	Seventh st., between H and I SW.....				16	10			30.59
Riley.....	Wyoming ave. NW.....				8	9			16.45
k Palmer.....	Fourteenth and Chapin sts. NW.....			6					7.43
t Portner.....	Virginia ave., between Sixth and Seventh SE.....				9				10.70
rd Rothwell.....	Massachusetts ave., between Ninth and Tenth NE.....				13	5			11.27
Church.....	Water st., Georgetown.....	10							28.53
Galt & Co.....	Indiana ave. and D st. NW.....	94	117						251.14
es King.....	1212, 1214 Tenth st. NW.....			6					11.31
Over.....	417 First st. SE.....				18				5.32
G. R. R. Co.....	Labor only.....								1,651.50
Foley.....	H st., between Third and Fourth NE.....				9	8			10.44
Wall.....	708 First st. NW.....				6	8			2.75
as City Packing.....	1009 B st.....	94			26				240.83
Horning.....	Lot 9, between Sixth and Seventh NE.....				11				12.75
Prall.....	Hotel Arno.....	18			4				41.83
Miss.....	Sixth st. extended.....				7				14.13
Morgan.....	O st., between Third and New Jersey ave. NW.....	11							36.13
Douglass.....	H st., between Thirteenth and Fourteenth.....				75				49.85
Total.....		232	686	70	310	263	514	32	\$9,021.57

The appropriation for construction and repair of bridges was \$10,000, out of which \$6,425 was allotted to the street department. The heavy floods in the month of June, 1889, caused great damage to the pier of the new free bridge, which required an outlay of \$4,629.49 to properly secure and make it safe. The total expenditures were \$6,424.64, as shown by statement marked E.

E.—*Work done under appropriation for construction and repair of bridges from July 1889, to June 30, 1890.*

	K street, NW.	M street NW.	M street SW.	P street NW.	N street SW.	Anacostia.	New free.	Ches. and Ohio Canal.	Miscellaneous.
Cost of labor	\$47.80	\$242.20	\$155.50	\$46.45	\$40.05	\$45.15	\$418.04	\$3.00	.....
Cost of blacksmithing and material	37.13	797.46	112.11	64.67	4.96	104.95	4,251.79	.....	635.
Total	84.93	1,039.66	267.61	111.12	45.01	150.10	4,669.83	3.00	35.

Total, \$6,424.64.

ORDINARY CARE OF BRIDGES.

The appropriation for this work amounted to \$3,400. The street department has charge of all the bridges within the city limits, and has expended \$2,384.65 for wages of bridgekeepers, watchmen, laborers, fuel, lights, etc.

EMERGENCY FUND.

The appropriation for this fund was \$5,000, of which \$333.52 has been expended under the direction of this office.

PLUMBERS CUTS, ETC.

The following is a report of the repairs to plumber cuts since September 1, 1889, on which date an order was issued by the Commissioners fixing the cost of repairs to cuts as follows:

	Per sq. yd.
For sheet asphalt cuts	\$3.
For asphalt block and granite cuts	1.
For cobble cuts	
During the year (September 1, 1889, June 30, 1890) there were repaired—	
152 sheet asphalt cuts, 598.8 square yards, at \$3.60	\$2,155.
63 granite block cuts, 475.23 square yards, at \$1.35	642.
33 asphalt block cuts, 175.23 square yards, at \$1.35	237.
121 cobble cuts, 835½ square yards, at 45 cents	376.
24 sheet asphalt cuts repaved without preliminary base, at an actual cost of	292.
105 new asphalt blocks used, at 7.1 cents	7.

Total 393 cuts repaired, at a cost of..... 3,712.

The estimated cost of laying preliminary base and paving over cuts is as follows

	Per sq. yd.
Preliminary base	\$1.
Sheet asphalt surface	2.
	3.
Preliminary base	1.
Paving granite block	1.
	1.
Preliminary base	1.
Paving asphalt block	1.
	1.
Paving cobblestone	

iving been found that cuts in sheet asphalt pavements could be repaired for square yard, on July 8, 1890, the Commissioners ordered that the cost of re- g such cuts be reduced from \$3.60 to \$3.

E.—The difference between the fixed cost of repairs to cuts and the estimated the same may be explained by the fact that for the past year the broken used has been furnished at about cost for labor; but in the near future the stone must be purchased by contract, which will increase the cost to the third of estimated prices.

H. N. Moss,
Superintendent of Streets.

H. M. ROBERT,
Engineer Commissioner of the District of Columbia.

REPORT OF SUPERINTENDENT OF ROADS.

OFFICE OF THE ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA,
Washington, D. C., October 10, 1890.

I submit herewith a statement of expenditures made by my department during year 1889-'90, from various appropriations.

Very respectfully,

GEO. N. BEALE,
Superintendent of Roads.

ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

Expenditures—Repairing county roads and suburban streets, fiscal year 1889-'90.

Name of road.	Expended.	Name of road.	Expended.
EASTERN SECTION.		EASTERN SECTION—continued.	
tia	\$519. 50	Elvan avenue	\$35. 25
gs	1, 362. 26	Taylor street	20. 00
avenue	232. 20	Pennsylvania avenue extended (con-	
e street	824. 34	structing temporary roadway to	
o road	14. 75	bridge)	220. 75
ope	84. 87	Spring street	3. 62
on	343. 79		
on street	206. 50	Total	8, 249. 13
on street	339. 09		
on street	47. 87		
on street	206. 12	WESTERN SECTION.	
on road	452. 76	Argyle Mill road	271. 75
street	28. 49	Brookville	30. 00
road	206. 17	Broad Branch	472. 30
road	5. 25	Chain Bridge	100. 50
is avenue	696. 52	Chappell	682. 85
street	7. 50	Daniel's	77. 13
curse road	427. 85	Foxhall	354. 86
on road	164. 43	Grant	524. 21
on avenue	190. 62	Kling	138. 24
on road	217. 37	Loughborough	196. 18
on avenue	87. 38	Military	138. 37
on avenue	24. 15	Milk House Ford	61. 25
ad	20. 50	Murdock Mill	784. 24
street	8. 88	New Cut	1, 582. 05
ington street	45. 99	Pierce Mill	132. 93
er road	64. 12	Red Lane	40. 49
aneous labor	147. 18	Ridge Road	242. 55
al for general use	609. 92	Tennallytown	1, 433. 95
mithing	28. 30	Tunlaw	382. 48
road (Lincolnvile)	36. 28	Woodley Lane	2, 158. 41
ington street (Lincolnvile)	40. 91	Old Chain Bridge	50. 75
et street (Lincolnvile)	40. 92	Miscellaneous labor	686. 63
street (Hillsdale)	92. 42	Material for general use	55. 95
street (Hillsdale)	10. 57	Blacksmithing	128. 90
d street (Hillsdale)	20. 00	Thirty-ninth street, extended	62. 63
it street	20. 00	Thirty-seventh street, extended	98. 00
avenue	26. 99		
View avenue	2. 50	Total	10, 887. 64
street (Anacostia)	8. 75		
y street	35. 50		
unton road	20. 00		

Expenditures—Repairing county roads and suburban streets, fiscal year 1889-'90—Cont'd

Name of road.	Expended.	Name of road.	Expended.
CENTRAL SECTION.		CENTRAL SECTION—continued.	
A road	\$229.86	Whitney avenue	\$1034.4
Bates	170.87	Woodley lane	2,633.5
Blair	394.41	Miscellaneous labor	3,887.1
Bladensburg	22.25	Material for general use	293.2
Brentwood	1,115.26	Blacksmithing	321.6
Brown street	22.71	Klingbe road	389.2
Bunker Hill road	292.17	Belmont avenue	559.9
Carroll avenue	1,311.59	Howard avenue	99.5
Central avenue, No. 1	9.50	Centre street	2.0
Champlain avenue	247.20	Kenesaw avenue	22.0
Columbia road	1,109.81	Ontario avenue	33.1
Fourteenth street	1,693.02	Michigan avenue	315.5
Grant street	40.00	Adams street	28.7
Harwood road	760.77	North Capitol street	1,956.65
Lincoln avenue	2,198.28	Kalorama avenue	97.29
Linnaea Hill road	361.30	California avenue	163.78
Military	122.12	Connecticut avenue	146.43
Mintwood	63.00	Seventeenth street	9.75
Nineteenth street	5.00	R street	798.14
Oak street	16.50	First street, northwest	395.07
Park street	50.62	Milk House Ford road	139.59
Princeton street	615.59	Maple avenue	107.98
Queen Chapel road	215.70	Magnolia avenue	30.00
Riggs	338.22	Wyoming avenue	35.50
Rock Creek Church	754.90	Roanoke street	16.38
Sargent	184.08	Quincy street	475.75
Brightwood avenue	2,174.27	Twentieth street, extended	249.52
Sheridan avenue	3.25	Twelfth street, extended, northeast	429.98
Shepherd road	263.55	Gales street	161.50
Sixteenth street extended	797.25		
Sixth street extended	35.41	Total	30,861.10
Thirteenth street extended	1,013.05		

RECAPITULATION.

Eastern section	\$8,249.13
Western section	10,887.04
Central section	30,861.10
Total	49,997.27
Amount of appropriation	50,000.00
Expended	49,997.27
Balance	2.13

Construction and repair of bridges—fiscal year 1889-'90.

Bridges.	Expended.	Bridges.	Expended.
EASTERN SECTION.		CENTRAL SECTION—continued.	
Livingston road	\$7.25	Spring street	\$43.25
Benning Bridge	68.45	Military road	508.50
Material for general use	5.00	Fourth street extended, NE	102.01
Total	80.70	Fourteenth street road	21.36
WESTERN SECTION.		Pierce Mill road, over Rock Creek	782.18
Chain Bridge	690.77	Bunker Hill road	70.24
Broad Branch road	276.03	Brightwood avenue	123.75
Blacksmithing	12.09	Queen Chapel Road	174.84
Total	978.89	Miscellaneous labor	56.39
CENTRAL SECTION.		Michigan avenue	130.32
Klingbe Ford road	374.25	Lincoln avenue	17.75
Central avenue	146.15	Argyle Mill road	8.00
		Material for general use	159.42
		Pierce Mill road, over Piney Branch	58.63
		Total	2,487.1

RECAPITULATION.

Eastern section	\$80.
Western section	978.
Central section	2,487.
Total	3,545.

Appropriation for ordinary care of bridges, 1890.

for keeper of Chain Bridge.....	\$680.00
oil (coal, etc.)	29.25
outstanding bills.....	43.61
Total.....	732.86

Expenditures.—Appropriation for constructing county roads and suburban streets, 1890.

	Appropriation.	Expended.	Balance.	Excess over appropriation.
Indiana avenue extended to Bowen road*.....	\$25,000	\$24,506.43	\$493.57	
street extended, N.E.*	10,000	9,998.08	1.92	
Road *	13,000	10,460.21	2,539.79	
enth street extended*.....	10,000	9,999.99	.01	
ly street *.....	1,625	1,624.99	.01	
enth street *.....	5,000	4,988.02	11.98	
husetts avenue *.....	25,000	25,484.67		\$484.67
n street *.....	3,000	2,998.63	1.37	
wood avenue	10,000	9,996.85	3.15	
reek Church road	5,000	4,869.11	130.89	
road	3,500	3,499.85	.15	
enth street.....	1,000	994.61	5.39	
gton street, Anacostia.....	3,000	2,996.82	3.18	
n street, Anacostia	3,000	3,000.00		
on street, Anacostia	3,000	3,001.19		1.19
and Taylor streets, Anacostia.....	4,400	4,339.20	60.80	
d avenue, Mt. Pleasant (not used).....	1,000			
Hill road *.....	4,000	3,840.99	159.01	
oad	5,000	4,987.35	12.65	

work on these streets was not done under my supervision, but they are included in order to complete statement of work done under head of constructing county roads.
 including outstanding bills.

Auditures.—Appropriation for sprinkling, sweeping, and cleaning streets, etc., 1890.

ing watering wagons	\$42.00
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SUMMARY OF EXPENDITURES DURING FISCAL YEAR 1889-'90.

t repairs, county roads, etc., 1890	\$49,997.87
acting county roads, etc., 1890	131,580.99
action and repair of bridges, 1890	3,546.69
ry care of bridges, 1890.....	732.86
ling, sweeping, and cleaning streets, etc., 1890.....	42.00
Total	185,900.41

REPORT OF THE PARKING COMMISSION.

WASHINGTON, D. C., September 1, 1890.

The Parking Commission has the honor to submit its twentieth annual report for the fiscal year ending June 30, 1890:

The statement of the superintendent, Mr. T. Lanham, showing in detail the operations during the past fiscal year, is herewith respectfully submitted:

Enough at the risk of tiresome repetition, the Parking Commission feel it an imperative duty to again call your attention to the insufficiency of the annual appropriation allowed for its work. The amount is altogether inadequate for the constantly increasing demands.

For several years it was possible to keep abreast of city improvements in the matter of planting trees; but of late years the extension of streets, both in the city and suburbs, increases so rapidly that tree planting is far in arrears.

Only a fractional amount of the money appropriated is available for planting; in the absence of planting additional trees the present appropriation would not meet the expenses in the care and maintenance of those already set out.

There is an overwhelming amount of work which should have immediate attention. Miles of trees require trimming, so that the branches should not interfere with pedestrians and allow a better diffusion of light from the lamps.

A large number of the older trees require fresh soil, the holes enlarged by removing a portion of the pavement, and the surface lowered, the better to conserve water. At all times the unpaved spaces around the trees should be kept scrupulously clean. When these are covered with weedy growths an appearance of carelessness and neglect is imparted, which should not be tolerated in this city.

Then there are thousands of boxes which should be removed from the trees and wire netting substituted where necessary.

To enable the Parking Commission to properly prosecute the work assigned to it an annual appropriation of at least \$30,000 should be placed at its disposal.

The suggestion is again offered that the superintendent of parking, who is the chief executive officer of the Commission, have his salary increased at least \$200 per annum, to which he is eminently entitled.

Respectfully submitted.

WM. R. SMITH,
JOHN SAUL,
WILLIAM SAUNDERS.

Col. HENRY M. ROBERT, U. S. A.

Engineer Commissioner District of Columbia.

THE PARKING COMMISSION, DISTRICT OF COLUMBIA :

GENTLEMEN: I have the honor to submit the following statement of work done during the fiscal year ending June 30, 1890 :

Six thousand two hundred and forty old wooden tree boxes were removed and hauled to the nursery and assorted. The best of this lumber was used in making 3,000 boxes; 2,372 of this number were used on young trees set out during the year, and the remaining 628 were used in replacing old inferior boxes on trees of a few years' growth not large enough to have the boxes taken from them altogether.

Four thousand three hundred and fifty-five trees protected by woven wire being placed around them, the average cost of which was 43 cents per box on the tree.

The usual attention was given to trimming low limbs from trees which interfered with pedestrians, vehicles, and the proper dissemination of light from lamps; in addition to this, the Carolina poplars on Eighth street, northwest, between R and Florida avenue; Fifth street, northwest, between D and Florida avenue; I street, north, between Delaware avenue, northeast, and Rock Creek; French street; Canal street; South Carolina avenue, east of Pennsylvania avenue. East Washington; Fifteenth street, between Pennsylvania avenue and B street, northwest; East Capitol street, between First and Eleventh streets; and G street, between Third and Eleventh streets, southeast, were closely pruned and, notwithstanding the dry weather, have made a fine growth of young wood and are retaining their foliage in all its verdure.

In doing this trimming, thousands of loads of brush were removed. The amount expended for this work was \$2,545.53.

Inferior Negunda trees on S street, between Twelfth and Thirteenth streets, northwest, were removed and replaced by silver maples; the Negundas on Fifteenth street, between Q and S streets, were also removed and replaced by tulip trees, and the Negundas on S street, between Sixteenth street and New Hampshire avenue, were removed and replaced by silver maples.

Two thousand three hundred and seventy-two trees were planted on the streets and avenues, and are in excellent condition.

Five thousand three hundred and thirty-seven young trees (seedlings) were set out in the nursery and are doing well. The nursery is in a flourishing condition and at least 10,000 trees of the best varieties could be planted on the streets were the means available to make the necessary preparation.

Four hundred and ninety-seven old, decayed, and dangerous trees were removed at a cost of about \$1.75 per tree and paid for out of the appropriation for the parking commission.

The removal of 93 trees was rendered necessary by street improvements on Thirty-fourth street, between N and P streets northwest; Thirty-third street, between N and Prospect avenue; Twenty-second street, between M and O streets northwest; and Second street southwest, between C and Virginia avenue, which was paid for out of the appropriation for improving these streets.

The trees on Thirty-third and Thirty-fourth streets were very large and the stumps unwieldy to load. The average cost per tree for removing these was \$2.20.

Caterpillars appeared in large numbers during the first and last quarters of the fiscal year and \$983.22 was expended in clipping the affected branches on large trees and spraying the smaller ones with London Purple; of this last mentioned expenditure \$500 was obtained from the emergency fund and \$483.22 was used from the appropriation for the parking commission.

All the tree holes made have been paved around and much root pruning and repairing pavements about large trees where roots had disturbed the same has been performed.

Thirty-eight thousand five hundred and ninety-one bricks, removed from tree spaces, were hauled to yard and delivered to engineer department.

It has been impossible to keep the unpaved spaces around the trees free from grass and weeds, and to mow the street parkings as often as they should be to keep them in good condition, without neglecting other work, which was absolutely necessary to be done.

The report for last fiscal year shows the number of trees on the streets and avenues of the city and county to be.....	66,185
Planted during year ending June 30, 1890.....	2,372
Total.....	68,557
Trees removed.....	590
Trees now on streets.....	67,967
Appropriation, parking commission.....	\$18,000.00
Allowed parking commission from emergency fund.....	500.00
Total.....	18,500.00
Expended for labor, teams, etc.....	\$14,670.61
Expended, material per public bills.....	3,828.31
Total expended.....	18,498.92
Balance of appropriation not expended.....	1.08

Very respectfully,

TRUEMAN LANHAM,
Superintendent for Parking Commission.

REPORT OF THE BOARD OF EXAMINERS OF STEAM ENGINEERS.

WASHINGTON, July 1, 1890.

GENTLEMEN: The examining board of steam engineers have the honor to make the following report for the year ending June 30, 1890. The number of applicants examined are as follows:

Months.	Class 1.	Class 2.	Class 3.	Not competent.	Total.
July.....	4	5	1	.....	10
August.....	1	.....	1	1	3
September.....	1	2	8	4	15
October.....	1	4	8	10	23
November.....	1	4	10	4	19
December.....	.....	2	1	4	7
January.....	1	5	5	5	16
February.....	1	.....	2	2	5
March.....	.....	.....	4	1	5
April.....	.....	2	2	3	7
May.....	3	1	6	1	11
June.....	3	6	8	1	18
Total.....	16	31	56	36	139

The present law under which we are working has done a great deal of good in the direction of elevating the engineers' standing; makes them more attentive and competent to fill the position for which they have been licensed.

Respectfully yours,

J. H. WILKERSON, *Chairman,*
H. BOESCH, *Secretary,*
Examining Board.

The COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

REPORT OF INSPECTOR OF BOILERS.

WASHINGTON, D. C., July 1, 1890.

GENTLEMEN: I have the honor to make the following report for the fiscal year ending June 30, 1890:

Fee boilers inspected.....	54
Boilers condemned for repairs.....	15
Condemned for new boilers.....	7
New boilers erected.....	63
Explosions.....	0
Boilers inspected for District of Columbia from which no fee is received.....	40
Total number of boilers inspected.....	49
Fees received from 454 boilers, at \$5 each.....	\$2,270.00
Total expense for the year.....	880.85
Profit.....	1,389.15

I would state that the past year has been one of great success, more so than any other year since I have been the inspector of steam boilers.

There has been no explosions under the inspection law, and I find the plants in better condition than ever before.

For bettering the condition of the office I would most respectfully recommend that the honorable Commissioners issue an order that all persons owning or using steam boilers in the District of Columbia be required to notify the inspector at least a days prior to expiration of certificate of inspection of their boilers.

I hope this will meet with your favorable consideration, as I believe if the order issued it will be a great benefit to the office as well as to those owning steam plants.

BOILERS INSPECTED.

July 1.—No. 1. Vertical tubular boiler in slaughterhouse, Cottage Hill, D. C., owned by J. H. Ruppert. Subjected to a hydrostatic pressure of 120 pounds; working pressure allowed, 80 pounds to the square inch. Expires July 1, 1890.

July 1.—No. 2. Vertical tubular boiler in slaughterhouse, Seventh street road, owned by John Ruppert Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to the square inch. Expires July 1, 1890.

July 2.—No. 3. Vertical tubular boiler in slaughterhouse, Ninth and C streets, northeast, owned by John Howard. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires July 2, 1890.

July 2.—No. 4. Vertical tubular boiler in wood and coal yard, Sampson street, between Fourteenth and Fifteenth streets, northwest, owned by Peter Dunn. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires July 2, 1890.

July 2.—No. 5. Vertical tubular boiler foot of Seventeenth street, northwest, owned by J. B. Lord, used for hoisting purposes. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds, if necessary 90 pounds, to square inch. Expires July 2, 1890.

July 2.—No. 6. Horizontal tubular boiler in Visitation Academy, Connecticut avenue and M street, northwest. Hydrostatic pressure, 40 pounds; working pressure allowed, 15 pounds to square inch. Expires July 2, 1890.

July 2.—No. 7. Horizontal tubular boiler in Visitation Academy, hydrostatic pressure, 30 pounds; working pressure allowed, 15 pounds to square inch. Condemned for repairs; repaired and passed. Expires July 2, 1890.

July 3.—No. 8. Horizontal tubular boiler at Ninth street wharf, owned by the Independent Ice Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds to square inch. Condemned for a new boiler; allowed to run five months. Expires December 3, 1889.

July 3.—No. 9. Vertical tubular boiler at Ninth street wharf, owned by the Independent Ice Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires July 3, 1890.

July 5.—No. 10. Vertical tubular boiler in wood and coal yard foot of Third street, southeast, owned by William H. Richards & Co. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Condemned for repairs; repaired and passed. Expires July 5, 1890.

July 8.—No. 11. Horizontal tubular boiler in Terra Cotta Works, Queenstown, D. C., owned by Potomac Terra Cotta Company. Hydrostatic pressure, 190 pounds; working pressure allowed, 120 pounds to square inch. Expires July 8, 1890.

- 8.—No. 12. Horizontal tubular boiler in Terra Cotta Works, Queenstown, D. C., owned by Potomac Terra Cotta Company. Hydrostatic pressure, 155 pounds; working pressure allowed, 100 pounds to square inch. Expires July 8, 1890.
- 9.—No. 13. New vertical tubular boiler in slaughterhouse, head of Ninth street, northwest, owned by Otto C. Ruppert. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires July 9, 1890.
- 10.—No. 14. New vertical tubular boiler in dye works and laundry, 1336 Ninth street, northwest, owned by R. C. Douglas. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds to square inch. Expires July 10, 1890.
- 10.—No. 15. Horizontal tubular boiler in Swiss Steam Laundry, F street, west, owned by Ira Godfrey. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires July 10, 1890.
- 11.—No. 16. Horizontal tubular boiler in building, corner New York avenue and Fifteenth street, northwest, owned by National Safe Deposit Company. Hydrostatic pressure, 80 pounds; working pressure allowed, 50 pounds to square inch. Expires July 11, 1890.
- 15.—No. 17. Horizontal tubular (east) boiler in planing mill, Thirteenth and D streets, northwest, owned by E. E. Jackson & Co. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires July 15, 1890.
- 15.—Nos. 18 and 19. Horizontal tubular boilers in planing mill, owned by Jackson & Co. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires July 15, 1890.
- 16.—Nos. 20 and 21. New horizontal tubular boilers in the Shoreham, corner Ninth and H streets, northwest, owned by Levi P. Morton. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds; if necessary, 90 pounds each to square inch. Expires July 16, 1890.
- 18.—No. 22. Horizontal tubular boiler in Swiss Steam Laundry, owned by Godfrey. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires July 18, 1891.
- 18.—No. 23. Horizontal tubular boiler in building, corner New York avenue and Fifteenth street, northwest, owned by the National Safe Deposit Company. Hydrostatic pressure, 80 pounds; working pressure allowed, 50 pounds to square inch. Expires July 18, 1890.
- 18.—No. 24. Horizontal tubular boiler in Willard's Hotel, O. G. Staples, proprietor. Hydrostatic pressure, 93 pounds; working pressure allowed, 60 pounds to square inch. Expires July 18, 1890.
- 19.—No. 25. Horizontal tubular boiler, at Thirteenth street wharf, south, owned by the American Ice Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 70 pounds to square inch. Expires July 19, 1890.
- 22.—No. 26. Horizontal tubular boiler in planing mill, foot of Ninth street, west, owned by Wimsatt & Uhler. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires July 22, 1890.
- 22.—Nos. 27¹, 28², and 29³. Horizontal tubular boilers in Agricultural Department. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires July 22, 1890.
- 22.—No. 30. Vertical tubular boiler in Agricultural Department (silk culture). Hydrostatic pressure 100 pounds; working pressure allowed, 60 pounds to square inch. Expires July 22, 1890.
- 25.—No. 31. Baxter boiler in ice-cream depot, 1425 New York avenue, north, owned by J. Fussell. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires July 25, 1890.
- 27.—No. 32. Vertical tubular boiler in steam bakery, 1254 Thirty-second street, west, owned by Fred. Stoholman. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires July 27, 1890.
- 27.—No. 33. Vertical tubular boiler in steam bakery, Thirteenth street between D streets, northwest, owned by Charles E. Koller. Hydrostatic pressure, 90 pounds; working pressure allowed, 50 pounds to square inch. Expires July 27, 1890.
- 29.—No. 34. Vertical tubular boiler in bottling works, northwest Georgetown, owned by Samuel C. Palmer. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires July 29, 1890.
- 29.—No. 35. Horizontal tubular boiler in car stables, Georgetown, owned by Georgetown and Georgetown Railroad Company. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires July 29, 1890.
- 30.—No. 36. Horizontal tubular boiler in pump house at gas works, Twenty-second and G streets northwest, owned by the Washington Gas Light Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires July 30, 1890.
- 30.—No. 37. Horizontal tubular boiler in exhaust house gas works, Twenty-second and G streets northwest, owned by the Washington Gas Light Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires July 30, 1890.

drostatic pressure, 120 pounds; working pressure allowed, 60 pounds; if necessary, pounds to square inch. Expires July 30, 1890.

July 30.—No. 38. Locomotive form boiler used for traction engine, owned by Sprinman & Bro. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires July 30, 1890.

July 31.—No. 39. Locomotive form boiler in machine shop gas works, Twenty-sixth and G streets northwest, owned by the Washington Gas Light Company. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds; if necessary, 60 pounds to square inch. Expires July 31, 1890.

August 1.—No. 40. Vertical tubular boiler in bottling works, Twenty-seventh and K streets northwest, owned by the Arlington Bottling Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 40 pounds; if necessary, 70 pounds to square inch. Expires August 1, 1890.

August 1.—No. 41. Horizontal tubular boiler in pump house at gas works, Twenty-sixth and G streets northwest, owned by the Washington Gas Light Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires August 1, 1890.

August 3.—No. 42. Horizontal tubular boiler in Fendall Building, 344 D street northwest, owned by Reginald Fendall. Hydrostatic pressure 125 pounds; working pressure allowed, 80 pounds to square inch. Expires August 3, 1890.

August 3.—No. 43. Vertical tubular boiler in Quaker Steam Laundry, 921 E street northwest, owned by H. L. Dumble. Hydrostatic pressure 110 pounds; working pressure allowed, 60 pounds; if necessary, 70 pounds to square inch. Expires August 3, 1890.

August 5.—No. 44. Horizontal tubular boiler in planing mill, Water street, Georgetown, owned by Wheatley Bros. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds; if necessary, 100 pounds to square inch. Expires August 5, 1890.

August 5.—No. 45. Horizontal tubular boiler in building, corner Thirteen-and-a-Half and B streets, northwest, owned by the United States Electric Lighting Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 95 pounds to square inch. Expires August 5, 1890.

August 5.—No. 46. Horizontal tubular boiler in building, Thirteen-and-a-Half and B streets, northwest, owned by United States Electric Lighting Company. Hydrostatic pressure, 155 pounds; working pressure allowed, 95 pounds to square inch. Expires August 5, 1890.

August 6.—No. 47. Horizontal tubular boiler in building, Thirteen-and-a-Half and B streets, northwest, owned by United States Electric Lighting Company. Hydrostatic pressure, 155 pounds; working pressure allowed, 95 pounds to square inch. Expires August 6, 1890.

August 6.—No. 48. Vertical tubular boiler, used for hoisting purposes, owned by Geo. H. Turton & Sons, bricklayers. Hydrostatic pressure, 120 pounds; working pressure allowed, 65 pounds to square inch. Condemned for new set of tubes and head; allowed to run two months. Expires October 6, 1889.

August 9.—No. 49. New horizontal tubular boiler in Adams building, F street northwest, owned by C. C. Willard. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires August 9, 1890.

August 9.—No. 50. Horizontal tubular boiler in Hooe building, F street, northwest, owned by C. C. Willard. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires August 9, 1890.

August 9.—No. 51. Vertical tubular boiler in brewery, Twenty-fifth and F streets northwest, owned by John Alberts. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires August 9, 1890.

August 9.—No. 52. Horizontal tubular boiler at Sixth street wharf, southwest, used for stone crusher, owned by Grumwell and W. H. Mohler. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires August 9, 1890.

August 12.—No. 53. New horizontal tubular boiler in Adams building, owned by C. C. Willard. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires August 12, 1890.

August 13.—No. 54. Vertical tubular boiler in bottling works, Virginia and Delaware avenues, southwest, owned by the Anheuser-Busch Brewing Company. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires August 13, 1890.

August 13.—No. 55. Vertical tubular boiler in wood and coal yard, 2115 E street northwest, owned by William Muirhead. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires August 13, 1890.

August 13.—No. 56. Locomotive form boiler in wood and coal yard, 519 Twenty-first street, northwest, owned by George S. Fairfax. Hydrostatic pressure, 100

pounds; working pressure allowed, 60 pounds to square inch. Expires August 13, 1890.

August 13.—No. 57. Vertical tubular boiler in slaughterhouse, Seventh street road, owned by Widmayer Bros. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds to square inch. Expires August 15, 1890.

August 15.—No. 58. Horizontal tubular boiler in Arlington Hotel, T. E. Roesselle, proprietor. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds; if necessary, 70 pounds to square inch. Expires August 16, 1890.

August 16.—No. 59. Horizontal tubular boiler in The Portland, Vermont avenue and Fourteenth street, northwest. Hydrostatic pressure, 105 pounds; working pressure allowed, 60 pounds to square inch. Expires August 16, 1890.

August 16.—No. 60. Locomotive form boiler at wharf, Georgetown; owned by Great Falls Ice Company. Hydrostatic pressure, 105 pounds; working pressure allowed, 60 pounds to square inch. Expires August 16, 1890.

August 17.—No. 61. Vertical tubular boiler in slaughterhouse, Bladensburg Road, owned by Santus Anth. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds to square inch. Expires August 17, 1890.

August 19.—No. 62. Horizontal tubular boiler in printing office, Eleventh street, above Pennsylvania avenue, northwest, owned by Judd & Detweiler. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires August 19, 1890.

August 19.—Nos. 63 and 64. Horizontal tubular boilers in planing mill, First and G streets, northeast, owned by Thomas W. Smith. Hydrostatic pressure, 140 pounds; working pressure allowed, 70 pounds; if necessary, 90 pounds each to square inch. Expires August 19, 1890.

August 19.—Nos. 65 and 66. Horizontal tubular boilers in Saks Building, corner Seventh street and Market Space, owned by Saks & Co. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds each to square inch. Expires August 19, 1890.

August 20.—Nos. 67 and 68. Horizontal tubular boiler in Central Building, corner Pennsylvania avenue and Ninth street, northwest, owned by Gunton estate. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds each to square inch. Expires August 20, 1890.

August 22.—No. 69. Locomotive form boiler in Potomac Box Factory, 508 R street, northwest, owned by R. A. Daniell. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires August 22, 1890.

August 23.—No. 70. Vertical tubular boiler in Carpet Cleaning Works, Fifth and K streets, southeast, owned by F. H. Youngs. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires August 23, 1890.

August 23.—Nos. 71 and 72. Horizontal tubular boilers in Ebbitt House, owned by C. C. Willard. Hydrostatic pressure, 110 pounds; working pressure allowed, 70 pounds each to square inch. Expires August 23, 1890.

August 23.—No. 73. Horizontal tubular boiler in Arlington Hotel, T. E. Roesselle, proprietor. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds; if necessary, 70 pounds to square inch. Expires August 23, 1890.

August 24.—No. 74. Locomotive form boiler in 929 D street, northwest, owned by Kingsley Brothers. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires August 24, 1890.

August 26.—No. 75. Locomotive form boiler in brick yard, Twenty-first and A streets, southeast, owned by C. R. Monroe & Co. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds to square inch. Condemned for a new boiler. Allowed to run four months. Expires December 26, 1889.

August 27.—No. 76. Vertical tubular boiler in greenhouse, Bladensburg road, owned by C. Strauss & Co. Hydrostatic pressure 150 pounds; working pressure allowed, 80 pounds; if necessary, 90 pounds to square inch. Condemned for repairs; allowed to run six months. Expires February 27, 1890.

August 27.—No. 77. Locomotive-form boiler in wood and coal yard, Sixth street and Virginia avenue, south east, J. E. Rose, agent. Hydrostatic pressure 100 pounds; working pressure allowed, 60 pounds to square inch. Expires August 27, 1890.

August 28.—No. 78. Locomotive-form boiler at Tenth street wharf, southwest, owned by Great Falls Ice Company. Hydrostatic pressure 125 pounds; working pressure allowed, 60 pounds; if necessary, 70 pounds to square inch. Expires August 28, 1890.

August 28.—No. 79. Horizontal tubular boiler in bottling works, Virginia avenue, between Sixth and Seventh streets, southwest, owned by Samuel C. Palmer. Hydrostatic pressure 120 pounds; working pressure allowed, 80 pounds to square inch. Expires August 28, 1890.

August 30.—No. 80. Vertical tubular boiler in bottling works corner Tenth and I streets, southeast, owned by Fred Herrmann. Hydrostatic pressure 100 pounds; working pressure allowed, 50 pounds to square inch. Expires August 30, 1890.

August 30.—No. 81. Horizontal tubular boiler in Hooe building, F street, north-

west, owned by C. C. Willard. Hydrostatic pressure 105 pounds; working pressure allowed, 60 pounds to square inch. Expires August 30, 1890.

September 2.—Nos. 82 and 83. Horizontal tubular boilers in building, F street, northwest owned by W. H. Houghton & Co. Hydrostatic pressure 120 pounds; working pressure allowed, 70 pounds each to square inch. Expires September 2, 1890.

September 3.—No. 84. Horizontal tubular boiler in pump house, gas works, Twenty-sixth and G streets, northwest, owned by Washington Gas Light Company. Hydrostatic pressure 130 pounds; working pressure allowed, 75 pounds to square inch. Condemned for repairs; repaired and passed. Expires September 3, 1890.

September 3.—No. 85. New horizontal tubular boiler in reform school, used for heating purposes. Hydrostatic pressure 120 pounds; working pressure allowed, 50 pounds; if necessary, 70 pounds to square inch. Expires September 3, 1890.

September 3.—No. 86. New vertical tubular boiler in reform school, used in laundry. Hydrostatic pressure 120 pounds; working pressure allowed, 50 pounds; if necessary, 70 pounds to square inch. Expires September 3, 1890.

September 3.—No. 87. Vertical tubular boiler in pumping station at Reform School. Hydrostatic pressure 120 pounds; working pressure allowed, 50 pounds; if necessary, 70 pounds to square inch. Expires September 3, 1890.

September 4.—No. 88. Horizontal tubular boiler in Riggs House, C. W. Spofford, proprietor. Hydrostatic pressure 124 pounds; working pressure allowed, 70 pounds to square inch. Expires September 4, 1890.

September 5.—No. 89. Vertical tubular boiler on steam roller No. 18 owned by the Barber Asphalt Paving Company. Hydrostatic pressure 150 pounds; working pressure allowed, 100 pounds to square inch. Expires September 5, 1890.

September 5.—No. 90. New horizontal tubular boiler in 1226 F street, northwest, owned by (Henry Strong) Julius Lansburgh, proprietor. Hydrostatic pressure 150 pounds; working pressure allowed, 70 pounds; if necessary, 80 pounds to square inch. Expires September 5, 1890.

September 6.—No. 91. New horizontal tubular boiler in 1226 F street, northwest. Hydrostatic pressure 150 pounds; working pressure allowed, 70 pounds; if necessary, 80 pounds to square inch. Expires September 6, 1890.

September 6.—No. 92. Horizontal tubular boiler in exhaust house gas works Twenty-sixth and G streets northwest, owned by the Washington Gas Light Company. Hydrostatic pressure 140 pounds; working pressure allowed 60 pounds; if necessary, 70 pounds to the square inch. Expires September 6, 1890.

September 6.—Nos. 93 and 94. Horizontal tubular boiler in Post Building, Tenth and D streets, northwest, owned by The Daily Post Publishing Company. Hydrostatic pressure 95 pounds; working pressure allowed, 60 pounds each to square inch. Expires September 6, 1890.

September 6.—No. 95. Retested vertical tubular boiler in Agricultural Department (silk culture). Hydrostatic pressure 100 pounds; working pressure allowed, 60 pounds to square inch. Expires September 6, 1890.

September 7.—Nos. 96 and 97. New horizontal tubular boiler in Perry Building, corner Pennsylvania avenue and Ninth streets, northwest, owned by Seaton Perry. Hydrostatic pressure 140 pounds; working pressure allowed, 60 pounds each to square inch. Expires September 7, 1890.

September 9.—No. 98. Horizontal tubular boiler in gas works, Georgetown, owned by the Georgetown Gas Light Company. Hydrostatic pressure 110 pounds; working pressure allowed, 60 pounds to square inch. Expires September 9, 1890.

September 10.—No. 99. Vertical tubular boiler in steam bakery 420 Fourth and a-half street, southwest, owned by Charles Schafer. Hydrostatic pressure 125 pounds; working pressure allowed, 70 pounds to square inch. Expires September 10, 1890.

September 10.—No. 100. Vertical tubular boiler in Glenwood Cemetery used for pumping purposes. Hydrostatic pressure 80 pounds; working pressure allowed, 40 pounds to square inch. Expires September 10, 1890.

September 10.—Nos. 101 and 102. Horizontal tubular boilers sold by Forsberg & Murray, and sent to Virginia. Hydrostatic pressure 150 pounds; working pressure allowed, 105 pounds each to the square inch. Expires September 10, 1890.

September 11.—No. 103. Horizontal tubular boiler in printing office corner Pennsylvania avenue and Thirteenth streets, northwest, owned by Gibson Bros. Hydrostatic pressure 120 pounds; working pressure allowed, 80 pounds to square inch. Expires September 11, 1890.

September 11.—No. 104. Vertical tubular boiler in Mt. Olivet Cemetery, used for pumping. Hydrostatic pressure 135 pounds; working pressure allowed, 80 pounds to square inch. Expires September 11, 1890.

September 12.—No. 105. Locomotive-form boiler in brickyard, South Capitol street, owned by T. Martin & Bro. Hydrostatic pressure 100 pounds; working pressure allowed, 60 pounds to square inch. Expires September 12, 1890.

September 12.—No. 106. Vertical tubular boiler in hot house, Lincoln avenue 12,

y, owned by George Field & Bro. Hydrostatic pressure 120 pounds; working are allowed, 75 pounds to square inch. Expires September 12, 1890.

tember 12.—No. 107. Vertical tubular boiler in photolithographing establish-461 C street, northwest, owned by Bell Bros. Hydrostatic pressure 120 pounds; ing pressure allowed, 75 pounds to square inch. Expires September 12, 1890.

tember 13.—No. 108. Vertical tubular boiler in printing office 514 Eighth street, west, owned by Byron S. Adams. Hydrostatic pressure 100 pounds; working are allowed, 60 pounds to square inch. Expires September 13, 1890.

tember 14.—No. 109. Vertical tubular boiler in Connecticut Pie Bakery, 1407 y-second street, West Washington, owned by H. Copperthite & Co. Hydro- pressure 110 pounds; working pressure allowed, 60 pounds to square inch. Expires September 14, 1890.

tember 14.—No. 110. Vertical tubular boiler in Acme Laundry, F street, north- owned by P. D. Welcker. Hydrostatic pressure 120 pounds; working pressure ed, 80 pounds to square inch. Expires September 14, 1890.

tember 16.—No. 111. Vertical tubular boiler in hair factory, Anacostia, D. C., d by Geo. J. Thomas & Bro. Hydrostatic pressure, 120 pounds; working pres- allowed, 80 pounds to square inch. Expires September 16, 1890.

tember 16.—No. 112. Horizontal tubular boiler in brickyard, South Capitol y, owned by Ford & Bro. Hydrostatic pressure, 120 pounds; working pressure ed, 70 pounds to square inch. Expires September 16, 1890.

tember 17.—No. 113. Horizontal tubular boiler in Second National Bank, ith street, northwest. Hydrostatic pressure, 100 pounds; working pressure al- l, 60 pounds to square inch. Expires September 17, 1890.

tember 17.—Nos. 114 and 115. Horizontal tubular boilers in The Portland, ont avenue and Fourteenth street, northwest. Hydrostatic pressure, 105 pounds; ing pressure allowed, 60 pounds each to square inch. Expires September 17,

tember 18.—No. 116. Locomotive-form boiler in City Post Office. Hydrostatic are, 100 pounds; working pressure allowed, 50 pounds to square inch. Expires mber 18, 1890.

tember 18.—No. 117. Horizontal tubular boiler in City Post Office. Hydrostatic are, 100 pounds; working pressure allowed, 50 pounds to square inch. Expires mber 18, 1890.

tember 23.—No. 118. Horizontal tubular boiler in Kellogg Building, F street west, owned by H. A. Willard. Hydrostatic pressure, 140 pounds; working are allowed, 80 pounds to square inch. Expires September 23, 1890.

tember 23.—Nos. 119 and 120. Horizontal tubular boilers in Corcoran Building, nth street and Pennsylvania avenue, northwest, owned by estate of W. W. ran. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds; ecessary, 80 pounds each to square inch. Expires September 23, 1890.

tember 24.—No. 121. Horizontal tubular boiler in Boston dry-goods house, cor- leyenth and F streets, northwest, owned by Woodward & Lothrop. Hydro- pressure, 140 pounds; working pressure allowed, 60 pounds; if necessary, 80 ls to square inch. Expires September 24, 1890.

tember 25.—No. 122. Vertical tubular boiler on steam roller No. 15, owned ie Barber Asphalt Paving Company. Hydrostatic pressure, 150 pounds; work- ressure allowed, 100 pounds to square inch. Expires September 25, 1890.

tember 25.—No. 123. Horizontal tubular boiler in Riggs House, C. W. Spofford ietor. Hydrostatic pressure, 120; working pressure allowed, 70 pounds to e inch. Expires September 25, 1890.

tember 25.—No. 124. Locomotive-form boiler in The Arno, Sixteenth street, west, Wm. E. Prall, proprietor. Hydrostatic pressure, 120 pounds; working are allowed, 70 pounds to square inch. Expires September 25, 1890.

tember 25.—No. 125. New horizontal tubular boiler in The Arno. Hydrostatic are, 140 pounds; working pressure allowed, 70 pounds to square inch. Expires mber 25, 1890.

tember 25.—No. 126. Baxter boiler in photolithographic establishment, Penn- nia avenue, northwest, owned by Norris Peters. Hydrostatic pressure, 100 ls; working pressure allowed, 60 pounds to square inch. Expires September 25, 1890.

tember 26.—No. 127. Horizontal tubular boiler in Kellogg Building, owned by . Willard. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 ls to square inch. Expires September 26, 1890.

tember 26.—No. 128. Horizontal tubular boiler in Harris Bijou Theater, P. s, proprietor. Hydrostatic pressure, 100 pounds; working pressure allowed, inds to square inch. Expires September 26, 1890.

tember 26.—No. 129. Large horizontal tubular boiler in U. S. Coast and Geodetic y Office, New Jersey avenue, southeast. Hydrostatic pressure 100 pounds; ug pressure allowed, 30 pounds to square inch. Expires September 26, 1890.

September 26.—No. 130. Small horizontal tubular boiler in U. S. Coast and Geodetic Survey Office. Hydrostatic pressure, 60 pounds; working pressure allowed, 30 pounds to square inch. Expires September 26, 1890.

September 27.—No. 131. Horizontal tubular boiler in 614 F street, northwest, owned by Eastern Railroad Association. Hydrostatic pressure, 90 pounds; working pressure allowed, 30 pounds to square inch. Expires September 27, 1890.

September 27.—No. 132. Horizontal tubular boiler in The Clarendon, corner New York avenue and Fourteenth street, northwest, Mrs. M. J. Colley, proprietress. Hydrostatic pressure 100 pounds; working pressure allowed, 60 pounds to square inch. Expires September 27, 1890.

September 28.—No. 133. New vertical tubular boiler in restaurant 417 Thirteenth street, southwest, owned by Karl Heurich. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires September 28, 1890.

September 30.—No. 134. New vertical tubular boiler in Briggs's New York dye house, 709 Ninth street, northwest. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. Expires September 30, 1890.

September 30.—No. 135. Horizontal tubular boiler in guano factory, Geisbore Point, D. C., owned by P. Mann. Hydrostatic pressure, 110 pounds; working pressure allowed, 70 pounds to square inch. Expires September 30, 1890.

September 30.—No. 136. New vertical tubular boiler in depot, Virginia avenue and Sixth street, southwest, owned by the Bergner and Engel Brewing Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. H. L. Dantrich, manager. Expires September 30, 1890.

October 1.—No. 137 and 138. Horizontal tubular boilers in the Langham, Fourteenth and H streets, northwest, J. F. Cook, owner. Hydrostatic pressure, 140 pounds; working pressure allowed, 70 pounds, if necessary 80 pounds, each to square inch. Expires October 1, 1890.

October 1.—No. 139. Horizontal tubular boiler in Wormley's Hotel, Fifteenth and H streets, northwest, owned by James Wormley's Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires October 1, 1890.

October 2.—No. 140. Vertical tubular boiler in Harris House, J. H. Harris, proprietor. Hydrostatic pressure, 130 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires October 2, 1890.

October 4.—No. 141. Baxter boiler in Cider Mill, 611 Seventh street, northwest, owned by Empire Steam Cider Company, Samuel Lloyd, manager. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires October 4, 1890.

October 4.—No. 142. Horizontal tubular boiler in Atlantic Building. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires October 4, 1890.

October 4.—No. 143. Horizontal tubular boiler in Wormley's Hotel, owned by James Wormley's Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires October 4, 1890.

October 5.—No. 144. Vertical tubular boiler in Columbia File Works, C street, northwest, owned by Henry Rosendale. Hydrostatic pressure, 90 pounds; working pressure allowed, 40 pounds to square inch. Expires October 5, 1890.

October 5.—No. 145. Horizontal tubular boiler in Corcoran building, owned by estate of W. W. Corcoran. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires October 5, 1890.

October 15.—No. 146. New vertical tubular boiler in printing office, 511 Eleventh street, northwest, owned by William H. Moore. Hydrostatic pressure, 150 pounds; working pressure allowed, 50 pounds, if necessary 80 pounds, to square inch. Expires October 15, 1890.

October 15.—No. 147. New horizontal tubular boiler in Star building, corner Pennsylvania avenue and Eleventh street, northwest, owned by the Evening Star Publishing Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires October 15, 1890.

October 15.—No. 148. New vertical tubular boiler, American House, corner Seventh street and Pennsylvania avenue, northwest, Duffy & Leannarda, proprietors. Hydrostatic pressure, 150 pounds; working pressure allowed, 40 pounds, if necessary 70 pounds, to square inch. Expires October 15, 1890.

October 15.—No. 149. Horizontal tubular boiler in Atlantic building. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires October 15, 1890.

October 16.—No. 150. Vertical tubular boiler in restaurant, corner Seventh and G streets, northwest, owned by Schwing & Clarke. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires October 16, 1890.

October 16.—No. 151. Horizontal tubular boiler in Metropolitan Hotel, W. H. Sel-

den, proprietor. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires October 16, 1890.

October 16.—No. 152. Vertical tubular boiler in printing office, Seventh and G streets, northwest, owned by W. Koch. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires October 16, 1890.

October 17.—No. 153. Vertical tubular boiler in wood and coal yard, corner Eighth and O streets, northwest, owned by C. H. Burgess. Hydrostatic pressure, 90 pounds; working pressure allowed, 50 pounds to square inch. Expires October 17, 1890.

October 17.—No. 154. Vertical tubular boiler in restaurant, 604 Pennsylvania avenue, northwest, owned by P. Moore. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires October 17, 1890.

October 18.—No. 155. Vertical tubular boiler in wood and coal yard, First and Patten streets, northeast, owned by C. H. Burgess. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds to square inch. Expires October 18, 1890.

October 18.—No. 156. New vertical tubular boiler in hotel Fredonia, H street, between Thirteenth and Fourteenth streets, northwest, G. H. La Petra, proprietor. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires October 18, 1890.

October 18.—No. 157. Horizontal tubular boiler in the Hamilton, Fourteenth and K streets, northwest, William M. Gilsen, proprietor. Hydrostatic pressure, 115 pounds; working pressure allowed, 70 pounds to square inch. Expires October 18, 1890.

October 18.—No. 158. Locomotive-form boiler in Metropolitan Hotel, W. H. Selden, proprietor. Tested by hammer test; working pressure allowed, 40 pounds to square inch. Expires October 18, 1890.

October 19.—No. 159. New horizontal tubular boiler in Star building, owned by the Evening Star Publishing Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires October 19, 1890.

October 19.—Nos. 160 and 161. Horizontal tubular boilers in greenhouse, county, District of Columbia, owned by J. H. Small & Sons. Hydrostatic pressure, 70 pounds; working pressure allowed, 30 pounds each to square inch. Expires October 19, 1890.

October 21.—No. 162. Horizontal tubular boiler in Terra Cotta Works, Queenstown, D. C., owned by Potomac Terra Cotta Company. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires October 21, 1890.

October 21.—No. 163. Horizontal tubular boiler in Terra Cotta Works, owned by Potomac Terra Cotta Company. Hydrostatic pressure, 135 pounds; working pressure allowed, 110 pounds to square inch. Expires October 21, 1890.

October 22.—No. 164. Horizontal tubular boiler in the Hamilton, Wm. M. Gilsen, proprietor. Hydrostatic pressure, 115 pounds; working pressure allowed, 70 pounds to square inch. Expires October 22, 1890.

October 24.—No. 165. Horizontal tubular boiler in Evans building, 1420 New York avenue, northwest, owned by D. S. Evans, jr. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires October 24, 1890.

October 24.—No. 166. Horizontal tubular boiler in Carlisle building, or Boston dry goods house, Woodward & Lothrop, proprietors. Hydrostatic pressure, 140 pounds; working pressure, 60 pounds, if necessary 80 pounds, to square inch. Expires October 24, 1890.

October 25.—No. 167. Vertical tubular boiler in Elite Steam Laundry, 208 and 210 B street, northwest, Fred. G. Rogers, proprietor. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires October 25, 1890.

October 25.—No. 168. Vertical tubular boiler in wood and coal yard, Thirtieth street and Canal, Georgetown, owned by Mayfield & Heiston. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires October 25, 1890.

October 26.—No. 169. Horizontal tubular boiler in hotel Solari, Pennsylvania avenue, northwest, Joseph Mehler, proprietor. Hydrostatic pressure, 90 pounds; working pressure allowed, 50 pounds to square inch. Expires October 26, 1890.

October 28.—Nos. 170 and 171. Horizontal tubular boilers in dry goods house, Seventh street, northwest, owned by Lansburgh & Bro. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires October 28, 1890.

October 28.—Nos. 172 and 173. Horizontal tubular boilers in Washington Ammonia and Chemical Works, Twenty-seventh street, northwest. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds each to square inch. Expires October 28, 1890.

October 29.—No. 174. Horizontal tubular boiler in Agricultural Department, used in silk culture. Hydrostatic pressure, 130 pounds; working pressure allowed, 70 pounds, if necessary 80 pounds, to square inch. Expires October 29, 1890.

October 30.—No. 175. Vertical tubular boiler in machine shop, Twelfth and B

streets, northwest, owned by Shepherd & Hurley. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires October 20, 1890.

October 30.—No. 176. Horizontal tubular boiler in hotel Johnson, Thirteenth and E streets, northwest, E. L. Johnson, proprietor. Hydrostatic pressure, 140 pounds; working pressure allowed, 50 pounds, if necessary 80 pounds, to square inch. Expires October 30, 1890.

October 30.—No. 177. Locomotive-form boiler in wood and coal yard near Fourteenth and B streets, northwest, owned by George Bogus. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds, if necessary 60 pounds, to square inch. Expires October 30, 1890.

October 31.—Nos. 178 and 179. Horizontal tubular boilers in building southwest corner Pennsylvania avenue and Thirteenth street, northwest, owned by Richmond and Danville Railroad Company. Hydrostatic pressure, 100 pounds; working pressure allowed, 70 pounds each to square inch. Expires October 31, 1890.

October 31.—No. 180. Vertical tubular boiler in building southwest corner Pennsylvania avenue and Thirteenth street, northwest, owned by Richmond and Danville Railroad Company. Hydrostatic pressure, 95 pounds; working pressure allowed, 60 pounds to square inch. Expires October 31, 1890.

October 31.—No. 181. Horizontal tubular boiler in Hotel Johnson, E. L. Johnson proprietor. Hydrostatic pressure, 140 pounds; working pressure allowed, 50 pounds, if necessary, 80 pounds, to square inch. Expires October 31, 1890.

November 1.—Nos. 182^a and 183^a. Horizontal tubular boiler in building Thirteen-and-a-half and B streets, northwest, owned by United States Electric Lighting Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 95 pounds to square inch. Expires November 1, 1890.

November 2.—No. 184. Horizontal tubular boiler in planing mill Twelfth and B streets, northwest, owned by J. B. Hammond. Hydrostatic pressure, 140 pounds; working pressure allowed, 90 pounds to square inch. Expires November 2, 1890.

November 4.—No. 185. Horizontal tubular boiler in Moses building, corner Eleventh and F streets, northwest, owned by W. B. Moses & Son. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires November 1, 1890.

November 4.—Nos. 186 and 187. Horizontal tubular boilers in terra cotta works, owned by Thomas Somerville & Sons. Hydrostatic pressure, 165 pounds; working pressure allowed, 110 pounds each to square inch. Expires November 4, 1890.

November 5.—No. 188. New horizontal tubular boiler in Hillman House, North Capital street, N. J. Hillman, proprietor; John E. Talty, owner. Hydrostatic pressure, 150 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires November 5, 1890.

November 5.—Nos. 189^a and 190^a. Horizontal tubular boiler in building corner Thirteen-and-a-half and B streets, northwest, owned by United States Electric Lighting Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 95 pounds each to square inch. Expires November 5, 1890.

November 6.—No. 191. Horizontal tubular boiler in Moses building, corner Eleventh and F streets, northwest, owned by W. B. Moses & Son. Hydrographic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires November 6, 1890.

November 7.—No. 192. New vertical tubular boiler in printing office Ninth street, between E and F streets, northwest, owned by the National Economist Publishing Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires November 7, 1890.

November 7.—No. 193. Vertical tubular boiler in Masonic Hall, corner Ninth and F streets, northwest, owned by Masonic Hall Association of the District of Columbia, Noble D. Larner, secretary. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires November 7, 1890.

November 7.—No. 194^a. Horizontal tubular boiler in building Thirteen-and-a-half and B streets, northwest, owned by the United States Electric Lighting Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 95 pounds to square inch. Expires November 7, 1890.

November 8.—No. 195. New vertical tubular boiler in mattress factory, Nineteenth street, northwest, owned by H. A. Linger. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds, if necessary 100 pounds, to the square inch. Expires November 8, 1890.

November 8.—No. 196. Vertical tubular boiler in chemical works, Twenty-seventh street, northwest, owned by E. B. Warren. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires November 8, 1890.

November 8.—No. 197. Vertical tubular boiler in wood and coal yard, 464 E street, southwest, owned by R. J. Collins. Hydrostatic pressure, 90 pounds; working pressure

sure allowed, 40 pounds, if necessary 60 pounds, to square inch. Expires November 8, 1890.

November 8.—No. 198. Vertical tubular boiler at gas holder, K street, between Twenty-first and Twenty-second streets, northwest, owned by Washington Gas Light Company. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Condemned for repairs; repaired and passed. Expires November 8, 1890.

November 9.—No. 199. Vertical tubular boiler in hair factory, Anacostia, D. C., owned by H. A. Linger. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 9, 1890.

November 11.—No. 200. New horizontal tubular boiler in slaughter house, Seventh street road, owned by Jacob Franz. Hydrostatic pressure, 150 pounds; working pressure allowed, 70 pounds to square inch. Expires November 11, 1890.

November 11.—No. 201. Horizontal tubular boiler in brick yard owned by Washington Brick Machine Company. Hydrostatic pressure, 140 pounds; working pressure allowed, 85 pounds to square inch. Expires November 11, 1890.

November 11.—No. 202. Vertical tubular boiler in brick yard, used for cutting hay and pumping purposes, owned by Washington Brick Machine Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 11, 1890.

November 12.—No. 203. Vertical tubular boiler in The Woodmont, Thirteenth street and Iowa Circle, Theodore Friebus, proprietor. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds to square inch. Expires November 12, 1890.

November 13.—No. 204. Horizontal tubular boiler in The Woodmont. Hydrostatic pressure 105 pounds; working pressure allowed 30 pounds, if necessary 50 pounds, to square inch. Expires November 13, 1890.

November 13.—No. 205. Horizontal tubular boiler in Patent Office, used to run elevator. Hydrostatic pressure 125 pounds; working pressure allowed, 70 pounds to square inch. Expires November 13, 1890.

November 14.—No. 206. Vertical tubular boiler at Grant's Row, East Capitol street; C. S. Jordan, agent. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires November 14, 1890.

November 15.—No. 207. Vertical tubular boiler in wood and coal yard, Sixth and K streets, northwest, owned by George W. Merrill. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires November 15, 1890.

November 15.—No. 208. Vertical tubular boiler in Harvey's restaurant, corner Eleventh street and Pennsylvania avenue, northwest, owned by T. H. Harvey. Hydrostatic pressure, 120 pounds; working pressure allowed 50 pounds, if necessary 70 pounds, to square inch. Expires November 15, 1890.

November 15.—No. 209. Vertical tubular boiler in Welcker's Hotel and Restaurant, Fifteenth street, northwest, Ch. Felter, proprietor. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 15, 1890.

November 15.—No. 210. Horizontal tubular boiler, sold by Pettit & Dripps to C. R. Monroe & Co., to be used in brick yard, Twenty-first and A streets, southeast, in place of old boiler No. 75, which was condemned for a new one. Hydrostatic pressure 150 pounds; working pressure allowed, 80 pounds to square inch. Expires November 15, 1890.

November 16.—No. 211. Vertical tubular boiler in wood and coal yard, Delaware avenue and D street, northeast, owned by Elia Chelini. Hydrostatic pressure, 110 pounds; working pressure allowed, 70 pounds to square inch. Expires November 16, 1890.

November 19.—No. 212. Horizontal tubular boiler in McDowell's mill, corner North Capitol street and Massachusetts avenue, northeast, owned by McDowell & Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 18, 1890.

November 19.—No. 213. Vertical tubular boiler in B. and O. Bottling Works, 15, 17, and 19 D street northeast, owned by William H. Brinkley. Hydrostatic pressure, 85 pounds; working pressure allowed, 45 pounds to square inch. Expires November 19, 1890.

November 20.—No. 214. Vertical tubular boiler in tannery, L street between Seventh and Eighth streets southeast, owned by W. D. Sullivan. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires November 20, 1890.

November 21.—No. 215. Vertical tubular boiler in slaughter house, owned by F. P. Seibert. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 21, 1890.

November 23.—No. 216. Vertical tubular boiler in slaughter house, Bladensburg road, owned by J. J. West. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires November 23, 1890.

November 23.—No. 217. Vertical tubular boiler in slaughter house, Bladensburg

road, owned by Anton Ruppert. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires November 23, 1890.

November 23.—No. 218. Vertical tubular boiler in slaughter house, Bladensburg road, owned by N. Auth. Hydrostatic pressure, 118 pounds; working pressure allowed, 80 pounds to square inch. Expires November 23, 1890.

November 26.—No. 219. Vertical tubular boiler in printing office, 339 Pennsylvania avenue, northwest, owned by George R. Gray. Hydrostatic pressure, 80 pounds; working pressure allowed, 50 pounds to square inch. Condemned for new tubes; allowed to run three months; time extended three months. Expires February 26, 1890.

November 26.—No. 220. Vertical tubular boiler in Willard's Hotel, O. G. Staples, proprietor. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Condemned for a new boiler; allowed to run six months. Expires May 26, 1890.

November 27.—No. 221. Vertical tubular boiler, in Palace Steam Laundry, 113 Four-and-a-half street southwest, owned by W. F. Barker and E. Shepherdson. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires November 27, 1890.

November 27.—No. 222. Horizontal fine boiler, at Stephenson's wharf, owned by Stephenson & Bro. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds to square inch. Expires November 27, 1890.

November 27.—No. 223. Vertical tubular boiler, in Steam Coffee Mills, Maryland avenue and C street southwest, owned by W. J. Lowm. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires November 27, 1890.

November 28.—No. 224. Horizontal tubular boiler in brass works, D street between Twelfth and Thirteenth streets, northwest, owned by Robt. Leitch & Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 28, 1890.

November 28.—No. 225. Horizontal tubular boiler in iron foundry, Twelfth street and Ohio avenue, northwest, owned by C. A. Schneider's Sons. Hydrostatic pressure, 70 pounds; working pressure allowed, 40 pounds to square inch. Expires November 28, 1890.

November 30.—No. 226. Horizontal tubular boiler in Havenner's steam bakery, C street, northwest, owned by Charlton & Graves. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires November 30, 1890.

November 30.—No. 227. Vertical tubular boiler in 445, Seventh street, southwest, owned by Gatewood & Co., J. D. Gatewood, manager. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires November 30, 1890.

December 2.—No. 228 and 229. Horizontal tubular boilers in National Hotel, W. H. Crosby, proprietor. No. 228: Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds to square inch. No. 229: Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires December 2, 1890.

December 3.—No. 230. Horizontal tubular boiler in Sun Building, F street, northwest. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires December 3, 1890.

December 5.—No. 231. Horizontal tubular boiler in Sun Building, F street, northwest, A. S. Abell, agent. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires December 5, 1890.

December 6.—No. 232. Vertical tubular boiler in printing office, 1319 F street, northwest, owned by Brown & McElfresh. Hydrostatic pressure, 95 pounds; working pressure allowed, 50 pounds to square inch. Expires December 6, 1890.

December 6.—No. 233. Locomotive form boiler in round house, owned by Baltimore and Potomac Railroad Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires December 6, 1890.

December 7.—No. 234. Vertical tubular boiler in building, K street and New Jersey avenue, southeast, owned by the Baltimore United Oil Company, P. S. Foster, agent. Hydrostatic pressure, 95 pounds; working pressure allowed, 50 pounds to square inch. Expires December 7, 1890.

December 9.—No. 235. "New" horizontal tubular boiler in Sanitarium, Fourteenth street and Sheridan avenue, Mt. Pleasant, owned by Dr. Wm. A. Hammond. Hydrostatic pressure, 140 pounds; working pressure allowed, 60 pounds to square inch. Expires December 9, 1890.

December 10.—No. 236. "New" horizontal tubular boiler in Sanitarium. Hydrostatic pressure, 140 pounds; working pressure allowed, 60 pounds to square inch. Expires December 10, 1890.

December 10.—No. 237. Vertical tubular boiler in slaughter house Bladensburg road, owned by C. Keiny. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Condemned for repairs, repaired and passed. Expires December 10, 1890.

December 10.—No. 238. Horizontal tubular boiler in planing mill, corner Eighth and I streets, southwest, owned by J. H. Lewis. Hydrostatic pressure, 75 pounds; working pressure allowed, 60 pounds to square inch. Condemned for repairs; repaired and passed. Expires December 10, 1890.

December 12.—No. 239. Vertical tubular boiler in Kernan's Washington Theater, Eleventh and C streets, northwest, James L. Kernan, manager. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Condemned for repairs; repaired and passed. Expires December 12, 1890.

December 13.—No. 240. Horizontal tubular boiler in United States Post Office Department. Hydrostatic pressure, 75 pounds; working pressure allowed, 50 pounds to square inch. Expires December 13, 1890.

December 14.—Nos. 241 and 242. New tubular boilers built by the Campbell and Zell Company in building Thirteen-and-a-Half and B streets, northwest, owned by United States Electric Lighting Company. Hydrostatic pressure, 200 pounds; working pressure allowed, 115 pounds each to square inch. Expires December 14, 1890.

December 16.—No. 243. Vertical boiler in gas works, Twelfth and M streets, southeast, owned by the Washington Gas Light Company. Hydrostatic pressure, 155 pounds; working pressure allowed, 100 pounds to square inch. Expires December 16, 1890.

December 16.—No. 244. Vertical tubular boiler in steam bakery, Harrison street, Anacostia, D. C., owned by Frederick W. Bergmann. Hydrostatic pressure, 130 pounds; working pressure allowed, 70 pounds to square inch; condemned for repairs, repaired and passed. Expires December 16, 1890.

December 18.—No. 245. Vertical tubular boiler in restaurant, Seventh and D streets, northwest, C. H. Weser, proprietor. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds to square inch. Expires December 18, 1890.

December 18.—No. 246. Vertical tubular boiler in steam coffee mill in alley between H and I and Four-and-a-half and Sixth streets, southwest, owned by H. C. Browning. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires December 18, 1890.

December 19.—No. 247. Vertical tubular boiler in the Morgan House, 3206 M street, Georgetown, northwest, John R. and W. H. Lang, proprietors. Hydrostatic pressure, 85 pounds; working pressure allowed, 40 pounds to square inch. Expires December 19, 1890.

December 19.—No. 248. Horizontal tubular boiler in oyster depot, 3004 M street, Georgetown, northwest, owned by C. R. Fields. Hydrostatic pressure, 90 pounds; working pressure allowed, 40 pounds to square inch. Expires December 19, 1890.

December 19.—No. 249. Vertical tubular boiler at gas holder, Maryland avenue between Third and Four-and-a-half streets, southwest, owned by Washington Gas Light Company. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires December 19, 1890.

December 20.—No. 250. Horizontal tubular boiler in oyster house, 3002 M street, Georgetown, northwest, owned by James F. Simmons. Hydrostatic pressure, 90 pounds; working pressure allowed, 30 pounds to square inch; condemned for a new boiler; allowed to run three months. Expires December 20, 1890.

December 23.—No. 251. Vertical tubular boiler in Metropolitan Coffee and Spice Mills, New Jersey avenue and N street northwest, owned by J. A. Sweeney. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires December 23, 1890.

December 23.—No. 252. Vertical boiler in gas works, Twelfth and M streets, southeast, owned by Washington Gas Light Company. Hydrostatic pressure, 155 pounds; working pressure allowed, 100 pounds to square inch. Expires December 23, 1890.

January 1.—Nos. 253 and 254. Horizontal tubular boilers in Galt's Mill, corner First street and Indiana avenue, northwest, owned by Wm. M. Galt & Co. Hydrostatic pressure, 130 pounds; working pressure allowed, 85 pounds to square inch each. Expires January 1, 1891.

January 1.—No. 255. Vertical tubular boiler in slaughter house, Bladensburg road, owned by John Angusterfer. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires January 1, 1891.

January 4.—No. 256. Locomotive form boiler in steam laundry, 517 Ninth street, northwest, owned by the Morgan Steam Laundry Company. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires January 4, 1891.

January 7.—No. 257. Horizontal tubular boiler in the Normandie, Fifteenth and I streets, northwest, H. M. Cake, proprietor. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds; if necessary, 80 pounds to square inch. Expires January 7, 1891.

January 7.—No. 258. New horizontal tubular boiler in the Shoreham, Fifteenth and H streets, northwest, owned by Levi P. Morton. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires January 7, 1891.

January 7.—No. 259. New vertical tubular boiler in Fendall Building, owned by Reginald Fendall. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires January 7, 1891.

January 9.—No. 260. Horizontal tubular boiler in the Normandie. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds; if necessary, 80 pounds to square inch. Expires January 9, 1891.

January 10.—No. 261. Horizontal tubular boiler in machine shop and foundry, Sixth and O streets, southwest, owned by Chas. White & Co. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires January 10, 1891.

January 13.—No. 262. Vertical tubular boiler in 614 Eleventh street, southwest, owned by Columbia Machine Company, P. Maltby, superintendent. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds; if necessary, 100 pounds, to square inch. Expires January 13, 1891.

January 13.—No. 263. Horizontal tubular boiler in music hall, corner Ninth and D streets, northwest. Hydrostatic pressure, 130 pounds; working pressure allowed, 60 pounds; if necessary, 80 pounds, to square inch. Expires January 13, 1891.

January 17.—No. 264. New vertical tubular boiler at pumping station, Catholic University. Hydrostatic pressure 150 pounds; working pressure allowed, 90 pounds to square inch. Expires January 17, 1891.

January 18.—No. 265. New horizontal tubular boiler in Hotel Fredonia, H street, between Thirteenth and Fourteenth streets, northwest, G. L. La Fetra, proprietor. Hydrostatic pressure, 150 pounds; working pressure allowed, 30 pounds; if necessary, 80 pounds, to square inch. Expires January 18, 1891.

January 20.—No. 266. New locomotive form boiler in club house, G street, between Seventeenth and Eighteenth streets, northwest, owned by the Columbia Athletic Club. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds; if necessary, 80 pounds, to square inch. Expires January 20, 1891.

January 21.—No. 267. New vertical tubular boiler in National Homeopathic Hospital, N street, northwest. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires January 21, 1891.

January 24.—No. 268. Vertical tubular boiler in Washington Brass Works, 1212 D street, northwest, owned by Wm. H. Douglas. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires January 24, 1891.

January 24.—No. 269. Vertical tubular boiler in Central Iron Works, 1212 D street, northwest, owned by J. B. Daughton. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires January 24, 1891.

January 25.—No. 270. Vertical tubular boiler in Eagle Iron Works, Fourteenth and B streets, northwest, owned by Pettit & Dripps. Hydrostatic pressure, 85 pounds; working pressure allowed, 60 pounds to square inch. Expires January 25, 1891.

January 27.—Nos. 271 and 272. Horizontal tubular boilers in Center Market, owned by the Washington Market Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. Each expires January 27, 1891.

January 31.—No. 273. Vertical tubular boiler, used for hoisting purposes, owned by W. H. Hensen, bricklayer. Hydrostatic pressure, 90 pounds; working pressure allowed, 30 pounds, if necessary 60 pounds, to square inch. Expires January 31, 1891.

January 31.—No. 274. Horizontal tubular boiler in Center Market. Hydrostatic pressure, 160 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. Expires January 31, 1891.

February 1.—No. 275. New vertical tubular boiler in 1216 F street, northwest, owned by G. W. Bothwell. Hydrostatic pressure, 150 pounds; working pressure allowed, 60 pounds to square inch. Expires February 1, 1891.

February 6.—No. 276. Horizontal tubular boiler in planing mill, Thirteenth and C streets, northwest, owned by Belt & Dyer. Hydrostatic pressure, 155 pounds; working pressure allowed, 85 pounds, if necessary 100 pounds, to square inch. Expires February 6, 1891.

February 7.—No. 277. Horizontal tubular boiler in Steam Marble Works, 407 Thirteenth and one-half street, northwest, owned by J. F. Manning. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. Expires February 7, 1891.

February 7.—No. 278. Horizontal tubular boiler in South Washington Iron Works, owned by John Springman. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires February 7, 1891.

February 11.—No. 279. Horizontal tubular boiler in File Holder Works, Massachusetts avenue, northwest, owned by E. W. Woodruff. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires February 11, 1891.

February 11.—No. 280. Horizontal tubular boiler in National Theater, W. W. Rapley, manager. Hydrostatic pressure, 100 pounds; working pressure allowed, 65 pounds to square inch. Expires February 11, 1891.

February 11.—No. 281. Horizontal tubular boiler in brickyard owned by Washington Brick Machine Company. Hydrostatic pressure, 145 pounds; working pressure allowed, 90 pounds to square inch. Expires February 11, 1891.

February 13.—No. 282. New vertical tubular boiler, Hotel Fredonia, G. H. La Fetra, proprietor. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. Expires February 13, 1891.

February 13.—No. 283. Vertical tubular boiler in the Congressional Hotel, Henry Brock, proprietor. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires February 13, 1891.

February 13.—Nos. 284, 285, and 286. New vertical tubular boilers (used for hoisting purposes) at United States Library building. Hydrostatic pressure, 160 pounds; working pressure allowed, 90 pounds, if necessary 100 pounds each, to square inch. Expires February 13, 1891.

February 15.—Nos. 287, 288, and 289. New Babcock and Wilcox Company's boilers in steam plant, foot of Sixth street, southwest, owned by Washington and Georgetown Railroad Company. Hydrostatic pressure, 200 pounds; working pressure allowed, 125 pounds each to square inch. Expires February 15, 1891.

February 17.—No. 290. Horizontal tubular boiler in planing mill, corner D and North Capitol streets, northwest, owned by J. A. Plumley. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires February 17, 1891.

February 17.—No. 291. Vertical tubular boiler in laundry at United States Jail. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds to square inch. Condemned for a new boiler; allowed to run six months. Expires August 17, 1890.

February 18.—No. 292. Vertical tubular boiler in printing office, 1108 E street, northwest, owned by McQueen & Wallace. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires February 18, 1891.

February 18.—Nos. 293 and 294. Vertical tubular boilers at United States Library building (used for hoisting purposes). Hydrostatic pressure, 160 pounds; working pressure allowed, 90 pounds, if necessary 100 pounds, each to the square inch. Expires February 18, 1891.

February 18.—No. 295. Horizontal tubular boiler in National Theatre, W. W. Rapley, manager. Hydrostatic pressure, 115 pounds; working pressure allowed, 65 pounds to square inch. Expires February 18, 1891.

February 19.—No. 296. Horizontal tubular boiler in Government Printing Office. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Condemned for repairs; allowed to run six months. Expires August 19, 1890.

February 20.—No. 297. New vertical tubular boiler at St. Peter's Church, Capitol Hill, owned by Bryan Hanrahan. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires February 20, 1891.

February 20.—No. 298. New horizontal tubular boiler in 210 N street, southwest, owned by George Richardson. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds, if necessary 100 pounds, to square inch. Expires February 20, 1891.

February 20.—No. 299. New horizontal tubular boiler in steam laundry, 1422 Pennsylvania avenue, northwest, owned by S. C. Wallace. Hydrostatic pressure, 150 pounds; working pressure allowed, 60 pounds, if necessary 90 pounds, to square inch. Expires February 20, 1891.

February 22.—No. 300. Horizontal tubular boiler in Government Printing Office. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds, if necessary 90 pounds, to square inch. Expires February 22, 1891.

February 24.—No. 301. Vertical tubular boiler in Capitol Steam Laundry, Eighth street, northwest, owned by M. A. Weaver. Hydrostatic pressure, 150 pounds; working pressure allowed, 70 pounds, if necessary 100 pounds, to square inch. Expires February 24, 1891.

February 27.—No. 302. Horizontal tubular boiler in planing mill, Thirteenth and B streets, northwest, owned by E. E. Jackson & Co. Hydrostatic pressure, 155 pounds; working pressure allowed, 95 pounds, if necessary 100 pounds, to square inch. Expires February 27, 1891.

February 27.—No. 303. Horizontal tubular boiler in The Randall, Fifteenth street and Pennsylvania avenue, northwest, T. S. Leisenring, manager. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds to square inch. Expires February 27, 1891.

February 27.—No. 304. Horizontal flue boiler in planing mill, Missouri avenue, between Four-and-a-half and Sixth streets, owned by George T. Dearing. Hydrostatic

pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires February 27, 1891.

February 28.—No. 305. Horizontal tubular boiler in Washington Iron Foundry, 468 to 474 Maine avenue, southwest, owned by George White & Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Condemned for repairs; repaired and passed. Expires February 28, 1891.

March 1.—No. 306. Horizontal tubular boiler in Hotel Randall. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds to square inch. Expires March 1, 1891.

March 3.—No. 307. Vertical tubular boiler in greenhouse, Bladensburg road, owned by Strauss & Co. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires March 3, 1891.

March 5.—No. 308. North horizontal tubular boiler in Heurich Brewery, Twentieth street, northwest, owned by C. Heurich. Hydrostatic pressure, 140 pounds; working pressure allowed, 75 pounds to square inch. Expires March 5, 1891.

March 6.—No. 309. South horizontal tubular boiler in Heurich Brewery, owned by C. Heurich. Hydrostatic pressure, 130 pounds; working pressure allowed, 75 pounds to square inch. Expires March 6, 1891.

March 7.—No. 310. Vertical tubular boiler in greenhouse owned by Strauss & Co. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires March 7, 1891.

March 8.—No. 311. Vertical tubular boiler on steam roller Dexter, owned by The Cranford Paving Company. Hydrostatic pressure, 195 pounds; working pressure allowed, 120 pounds to square inch. Expires March 8, 1891.

March 12.—No. 312. Babcock & Wilcox Co., boiler at Eckington Station, owned by the Eckington and Soldiers' Home Railroad Company. Hydrostatic pressure, 195 pounds; working pressure allowed, 100 pounds, if necessary 125 pounds, to square inch. Expires March 12, 1891.

March 12.—No. 313. Horizontal tubular boiler in Washington Brewery, E street, between Thirteenth and Fourteenth street, southeast, owned by Henry Rabe. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires March 12, 1891.

March 13.—No. 314. Horizontal tubular boiler in Washington Brewery. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires March 13, 1891.

March 13.—No. 315. Vertical tubular boiler in wood and coal yard, South Capitol street, southeast, owned by John Miller. Hydrostatic pressure, 105 pounds; working pressure allowed, 60 pounds to square inch. Expires March 13, 1891.

March 14.—Nos. 316 and 317. Horizontal tubular boilers in brewery, Fourth and E streets northeast, owned by the Washington Brewery Company. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds; if necessary 90 pounds, each to square inch. Expires March 14, 1891.

March 15.—Nos. 318 and 319. Horizontal tubular boilers in brickyard, owned by I. Childs & Co. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds each to square inch. Expires March 15, 1891.

March 19.—Nos. 320 and 321. New horizontal tubular boilers in steam plant, Tennallytown road, owned by the Tennallytown and Georgetown Railway Company. Hydrostatic pressure, 152 pounds; working pressure allowed, 95 pounds each to square inch. Expires March 19, 1891.

March 22.—No. 322. Vertical tubular boiler in slaughterhouse, Half street southwest, owned by Fred Dietz. Hydrostatic pressure, 125 pounds; working pressure allowed, 60 pounds; if necessary 80 pounds, to square inch. Expires March 22, 1891.

March 24.—No. 323. Locomotive-form boiler in printing office 1308 Pennsylvania avenue northwest, owned by R. H. Darby. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Condemned for repairs, repaired and passed. Expires March 24, 1891.

March 25.—No. 324. Locomotive-form boiler in 631 and 635 Massachusetts avenue northwest, owned by Stumph & Bro. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires March 25, 1891.

March 27.—No. 325. Vertical tubular boiler in wood and coal yard, Water street, Georgetown. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds to square inch. Expires March 27, 1891.

March 27.—No. 326. New horizontal tubular boiler at Littlefield's Wharf, used for stone crusher, owned by the Barber Asphalt Paving Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires March 27, 1891.

March 27.—No. 327. Vertical tubular boiler at Littlefield's Wharf, foot of Twenty-sixth street northwest, owned by the Barber Asphalt Paving Company. Hydrostatic

pressure, 160 pounds; working pressure allowed, 100 pounds to square inch. Expires March 27, 1891.

March 28.—No. 328. Vertical tubular boiler in Fleming building, 1419 G street northwest, used to run elevator, owned by Robert I. Fleming. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds to square inch. Expires March 28, 1891.

March 29.—No. 329. Vertical tubular boiler in West End steam laundry 1755 Pennsylvania avenue northwest, owned by Henry Wagner. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires March 29, 1891.

March 31.—No. 330. Horizontal tubular boiler in brass works, Thirteenth street northwest, owned by Thomas Somerville & Sons. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Condemned for repairs, repaired and passed. Expires March 31, 1891.

April 2.—No. 331. New horizontal tubular boiler at Ninth Street Wharf, owned by Independent Ice Company. Hydrostatic pressure, 150 pounds; working pressure, 60 pounds; if necessary 80 pounds, to square inch. Expires April 2, 1891.

April 3.—No. 332. Horizontal tubular boiler in Glover building, F street, northwest, M. M. Parker, agent. Hydrostatic pressure, 90 pounds; working pressure allowed, 50 pounds to square inch. Expires April 3, 1891.

April 3.—No. 333. Horizontal tubular boiler in Glover building; tested by hammer test; working pressure allowed, 50 pounds to square inch. Expires April 3, 1891.

April 4.—No. 334. Vertical tubular boiler in Buckeye Steam Laundry, 618 Ninth street, northwest, owned by Conrad & Bozzell. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires April 4, 1891.

April 4.—Nos. 335 and 336. Horizontal tubular boilers in Heinrich's brewery, owned by C. Heinrich. Hydrostatic pressure, 130 pounds; working pressure allowed, 75 pounds to square inch. Expires April 4, 1891.

April 4.—No. 337. Vertical tubular boiler, used for hoisting purposes, owned by David T. Cissel, contractor. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires April 4, 1891.

April 7.—Nos. 338 and 339. Horizontal tubular boilers in brickyard, owned by A. Richards & Co. Hydrostatic pressure, 100 pounds; working pressure allowed, 50 pounds each to square inch; condemned for new boilers; allowed to run 6 months. Expires October 7, 1890.

April 11.—No. 340. Vertical tubular boiler in printing office, 625 Louisiana avenue northwest, owned by Thomas J. Brashear's Sons. Hydrostatic pressure, 100 pounds; working pressure allowed, 40 pounds to square inch. Expires April 11, 1891.

April 11.—No. 341. Vertical tubular boiler in printing office, D street, between Sixth and Seventh streets, northwest, owned by R. O. Polkinhorn. Hydrostatic pressure, 75 pounds; working pressure allowed, 50 pounds to square inch. Expires April 11, 1891.

April 11.—No. 342. Horizontal tubular boiler in planing mill, Thirteenth and B streets northwest; owned by E. E. Jackson & Co. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires April 11, 1891.

April 12.—No. 343. Horizontal tubular boiler in planing mill, Thirteenth and B streets northwest; owned by E. E. Jackson & Co. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires April 12, 1891.

April 14.—No. 344. Locomotive-form boiler in brick yard, South Capitol street, owned by James Richards. Hydrostatic pressure, 115 pounds; working pressure allowed, 70 pounds to square inch. Expires April 14, 1891.

April 15.—No. 345. Horizontal tubular boiler at Thirtieth Street Wharf (coal wharf) owned by Gilmor, Meredith & Co. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires April 15, 1891.

April 15.—No. 346. Vertical tubular boiler on lighter Chesapeake, owned by Littlefield & Alvord. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires April 15, 1891.

April 16.—No. 347. Vertical tubular boiler on lighter Potomac, owned by Littlefield & Alvord. Hydrostatic pressure, 160 pounds; working pressure allowed, 100 pounds to square inch. Expires April 16, 1890.

April 16.—No. 348. Vertical tubular boiler at Littlefield's Wharf used for hoisting purposes, owned by Littlefield & Alvord. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires April 16, 1891.

April 17.—No. 349. Horizontal tubular boiler at Eckington Station, Fourth and U streets northeast, owned by the Eckington and Soldiers' Home Railway Company. Hydrostatic pressure, 175 pounds; working pressure allowed, 110 pounds to square inch. Expires April 17, 1891.

April 17.—No. 350. Vertical tubular boiler at Eckington, Fourth and U streets northeast, used for pumping purposes; owned by George Truesdell. Hydrostatic

pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires April 17, 1891.

April 17.—No. 351. Horizontal tubular boiler in brewery, Fourth and E streets northeast, owned by the Washington Brewery Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires April 17, 1891.

April 17.—No. 352. Vertical tubular boiler on steam roller Percy, owned by the Cranford Paving Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires April 17, 1891.

April 18.—No. 353. Vertical tubular boiler at pumping station, Twenty-first and Boundary streets northwest, owned by George Truesdell. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires April 18, 1891.

April 18.—No. 354. Horizontal tubular boiler in Safe Deposit Building, Fifteenth street and New York avenue northwest, owned by National Safe Deposit Company. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires April 18, 1891.

April 21.—No. 355. Vertical tubular boiler in wood and coal yard foot of Twenty-sixth street northwest, owned by William E. Hodge. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires April 21, 1891.

April 21.—No. 356. New vertical tubular boiler at wharf, Georgetown, owned by the Independent Ice Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 90 pounds to square inch. Expires April 21, 1891.

April 22.—No. 357. Horizontal tubular boiler in brewery, Fourth and E streets northeast, owned by the Washington Brewery Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires April 22, 1891.

April 23.—No. 358. Horizontal tubular boiler in the Nation's Monumental Works, 129 to 133 Pennsylvania avenue northwest. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Owned by D. McMenamin. Expires April 23, 1891.

April 23.—No. 359. New vertical tubular boiler in 3228 K street northwest or Water street, Georgetown, owned by Curtis M. Smith & Co. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires April 23, 1891.

April 25.—No. 360. Locomotive-form boiler in depot, 624 and 626 Virginia avenue southwest, owned by the Robert Portner Brewing Company. Hydrostatic pressure, 125 pounds; working pressure allowed, 70 pounds to square inch. Condemned for repairs, repaired and passed. Expires April 25, 1891.

April 25.—No. 361. Horizontal tubular boiler in Safe Deposit Building, corner Fifteenth street and New York avenue northwest, owned by National Safe Deposit Company. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires April 25, 1891.

April 28.—No. 362. Locomotive-form boiler in wood and coal yard, Virginia and Delaware avenues southwest, owned by Walter H. Marlow. Hydrostatic pressure, 125 pounds; working pressure allowed, 70 pounds to square inch. Expires April 28, 1891.

April 28.—No. 363. Vertical tubular boiler in feed store, Seventh street, northwest, owned by Nixon Brewer. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires April 28, 1891.

April 29.—No. 364. Horizontal tubular boiler in printing office, 1107 E street, northwest, owned by McGill & Wallace. Hydrostatic pressure, 125 pounds; working pressure allowed, 75 pounds to square inch. Expires April 29, 1891.

April 29.—No. 365. Horizontal tubular boiler sold by Forsberg & Murray, to Stockstills Galvanized Iron Works, Fourteenth street, northwest. Hydrostatic pressure, 155 pounds; working pressure allowed, 100 pounds to square inch. Expires April 29, 1891.

April 30.—No. 366. Vertical tubular boiler in Harris House, Foland & Staats, proprietors. Hydrostatic pressure, 95 pounds; working pressure allowed, 60 pounds to square inch. Expires April 30, 1891.

May 2.—No. 367. Vertical tubular boiler in brickyard owned by John Webster. Hydrostatic pressure, 85 pounds; working pressure allowed, 50 pounds to square inch. Expires May 2, 1891.

May 3.—No. 368. New horizontal tubular boiler at Eckington Station, owned by the Eckington and Soldiers' Home Railway Company. Hydrostatic pressure, 170 pounds; working pressure allowed, 110 pounds to square inch. Expires May 3, 1891.

May 5.—Nos. 369 and 370. Vertical tubular boilers in Portland Steam Laundry Works, 1216 H street, northeast, owned by Portland Steam Laundry Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch each. Expires May 5, 1891.

May 6.—No. 371. Locomotive-form boiler at depot, owned by the Baltimore & Ohio Railroad Company. Hydrostatic pressure, 170 pounds; working pressure allowed, 110 pounds to square inch. Expires May 6, 1891.

May 6.—No. 372. Horizontal tubular boiler in wood and coal yard, Twelfth and Water streets, southwest, owned by Johnson Bros. Hydrostatic pressure, 125 pounds; working pressure allowed, 75 pounds to square inch. Expires May 6, 1891.

May 6.—No. 373. Vertical tubular boiler at Twelfth Street Wharf, southwest, owned by Johnson Bros. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires May 6, 1891.

May 7.—No. 374.—Vertical tubular boiler in locksmith shop, Sherffs Alley, between Third and Four-and-a-Half streets and Pennsylvania avenue and Missouri avenue, northwest, owned by August Kleinhenn. Hydrostatic pressure, 120 pounds; working pressure allowed, 50 pounds, if necessary 60 pounds, to square inch. Expires May 7, 1891.

May 8.—375. Locomotive-form boiler in wood and coal yard, I street, between Twenty-first and Twenty-second streets, northwest, owned by J. Maury Dove. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires May 8, 1891.

May 8.—No. 376. New horizontal tubular boiler in building Fifteenth and E streets, northeast, owned by the Hygienic Ice Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 105 pounds to square inch. Expires May 8, 1891.

May 9.—No. 377. New horizontal tubular boiler in building Fifteenth and E streets, northeast. Hydrostatic pressure, 160 pounds; working pressure allowed, 105 pounds to square inch. Expires May 9, 1891.

May 10.—No. 378. Vertical tubular boiler in wood and coal yard, Fourteenth and C streets, northwest, owned by J. Edward Chapman. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires May 10, 1891.

May 12.—No. 379. Horizontal tubular boiler in soap factory, Water street, Georgetown, D. C., owned by Weaver, Kengla & Co. Hydrostatic pressure, 130 pounds; working pressure allowed, 70 pounds to square inch. Expires May 12, 1891.

May 12.—No. 380. Horizontal tubular boiler in Lamond's Terra Cotta Works, Metropolitan Branch Baltimore & Ohio Railroad (Takoma Park), owned by Angus Lamond. Hydrostatic pressure, 184 pounds; working pressure allowed, 125 pounds to square inch. Expires May 12, 1891.

May 14.—No. 381. Vertical tubular boiler in wood and coal yard 15 Massachusetts avenue, northeast, owned by D. K. Hackman. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds, if necessary 80 pounds, to square inch. Expires May 14, 1891.

May 14.—No. 382. Locomotive form boiler in building Louisiana avenue and Seventh street, northwest, owned by Fireman's Insurance Company. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires May 14, 1891.

May 15.—No. 383. Vertical tubular boiler, used for hoisting purposes, owned by R. McMenamin, contractor. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires May 15, 1891.

May 15.—No. 384. Locomotive form boiler in car stables, owned by North O and South Capitol street Railroad Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires May 15, 1891.

May 16.—No. 385. Horizontal tubular boiler in steam carpet cleaning works, 483 Maine avenue, southwest, owned by estate of L. Rice. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires May 16, 1891.

May 17.—No. 386. Horizontal tubular boiler at wharf, gas works, Twenty-sixth and G streets, northwest, owned by the Washington Gaslight Company. Hydrostatic pressure, 125 pounds; working pressure allowed, 70 pounds to square inch. Expires May 17, 1891.

May 19.—Nos 387 and 388. New horizontal tubular boilers in concrete works at Littlefield's Wharf, owned by the Cranford Paving Company. Hydrostatic pressure 150 pounds; working pressure allowed, 80 pounds each to square inch. Expires May 19, 1891.

May 19.—No. 389. Vertical tubular boiler in concrete works at Littlefield's Wharf, owned by the Cranford Paving Company. Hydrostatic pressure, 90 pounds. working pressure allowed, 50 pounds to square inch. Expires May 19, 1891.

May 20.—No. 390. New vertical tubular boiler in iron works Thirty-third and Water streets, Georgetown, owned by Edward L. Dent. Hydrostatic pressure, 140 pounds; working pressure allowed, 90 pounds to square inch. Expires May 20, 1891.

May 20.—No. 391. Horizontal tubular boiler in Panorama building, Fifteenth street and Ohio avenue, northwest. Hydrostatic pressure, 145 pounds; working pressure allowed, 90 pounds to square inch. Expires May 20, 1891.

May 21.—No. 392. Vertical tubular boiler, foot of Seventeenth street, northwest, owned by J. B. Lord. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds to square inch. Expires May 21, 1891.

May 22.—No. 393. Vertical tubular boiler in grocery store, 614 and 616 Pennsylvania avenue, northwest, owned by James L. Barbour & Son. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires May 22, 1891.

May 22.—No. 394. Vertical tubular boiler in slaughterhouse, G street, between Third and Fourth streets, northeast, owned by Mrs. Johnson & Son. Hydrostatic pressure 130 pounds; working pressure allowed, 80 pounds to square inch. Expires May 22, 1891.

May 23.—No. 395. Vertical tubular boiler in Boston Steam Laundry, First and G streets, northwest, J. K. Korff, proprietor. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds, if necessary 90 pounds, to square inch. Expires May 23, 1891.

May 23.—No. 396. Vertical tubular boiler in wood and coal yard, Twelfth and Rhode Island avenue, northwest, owned by Pollard & Brother. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds to square inch. Expires May 23, 1891.

May 24.—No. 397. New vertical tubular boiler in Yale Steam Laundry, 522 Tenth street, northwest, owned by F. H. Walker. Hydrostatic pressure, 160 pounds; working pressure allowed, 70 pounds, if necessary 100 pounds, to square inch. Expires May 24, 1891.

May 24.—No. 398. Vertical tubular boiler in Pacific Building, F street between Sixth and Seventh streets, northwest, owned by Britton & Gray. Hydrostatic pressure 120 pounds; working pressure allowed, 80 pounds to square inch. Expires May 24, 1891.

May 24.—No. 399. Vertical tubular boiler in wood and coal yard, Third and P streets, northwest, owned by Mrs. J. E. Divver. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires May 24, 1891.

May 26.—No. 400. Horizontal tubular boiler in concrete works, Littlefield's Wharf, owned by the Cranford Paving Company. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds, if necessary 90 pounds, to square inch. Expires May 26, 1891.

May 26.—No. 401. Horizontal tubular boiler in Pacific Building. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds, if necessary 80 pounds, to square inch. Expires May 26, 1891.

May 26.—No. 402. Vertical tubular boiler at Eighth Street Wharf, owned by National Capital Ice Company. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds to square inch. Expires May 26, 1891.

May 27.—No. 403. Vertical tubular boiler, foot of G street, northwest, owned by J. Maury Dove. Hydrostatic pressure, 140 pounds; working pressure allowed, 80 pounds to square inch. Expires May 27, 1891.

May 27.—No. 404. Vertical tubular boiler foot of G street, northwest, owned by J. Maury Dove. Hydrostatic pressure, 140 pounds; working pressure allowed 70 pounds, if necessary 90 pounds, to square inch. Expires May 27, 1891.

May 28.—No. 405. Vertical tubular boiler used for hoisting purposes, owned by A. M. Cowell. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires May 28, 1891.

May 28.—No. 406. Horizontal tubular boiler in St. James Hotel, corner Sixth street and Pennsylvania avenue, northwest, Levi Woodbury, proprietor. Hydrostatic pressure, 125 pounds; working pressure allowed, 75 pounds to square inch. Expires May 28, 1891.

May 28.—No. 407. Vertical tubular boiler in machine shop at Bennings, D. C., owned by the American Energizer Manufacturing Company, limited. Hydrostatic pressure, 110 pounds; working pressure allowed, 70 pounds to square inch. Expires May 28, 1891.

May 29.—No. 408. Horizontal tubular boiler in United States Signal Office, Twenty-third and M streets, northwest. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires May 29, 1891.

May 29.—No. 409. Horizontal tubular boiler in brickyard, owned by the Washington Brick Machine Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 100 pounds to square inch. Expires May 29, 1891.

May 30.—No. 410. Vertical tubular boiler in carriage factory, 310 Pennsylvania avenue, northwest, owned by John McDermott & Bro. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires May 30, 1891.

May 30.—No. 411. Horizontal tubular boiler in St. James Hotel, Levi Woodbury, proprietor. Hydrostatic pressure, 125 pounds; working pressure allowed, 75 pounds to square inch. Expires May 30, 1891.

June 2.—No. 412. Vertical tubular boiler in slaughterhouse, Seventh street road, owned by A. Löffler. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires June 2, 1891.

June 2.—No. 413. Horizontal tubular boiler in the Richmond, corner Seventeenth and H streets, northwest; H. M. Cake, proprietor. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires June 2, 1891.

June 3.—No. 414. Vertical tubular boiler in slaughterhouse, Seventh street road, owned by A. Löffler. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires June 3, 1891.

June 3.—No. 415.—Horizontal tubular boiler in Lenman building, 1425 New York avenue, northwest, owned by J. T. Lenman. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires June 3, 1891.

June 3.—No. 416. New horizontal tubular boiler at gas holder, First and K streets, southwest, owned by the Washington Gaslight Company. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. Expires June 3, 1891.

June 5.—No. 417.—Vertical tubular boiler in dye works owned by 114 Four-and-a-Half street, northwest, owned by Birkner & Co. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires June 5, 1891.

June 5.—No. 418. Locomotive form boiler in Ebbitt House, corner Fourteenth and F streets, northwest, Burch and Gibbs, managers. Hydrostatic pressure, 100 pounds; working pressure allowed, 55 pounds to square inch. Expires June 5, 1891.

June 6.—No. 419. Vertical tubular boiler used for hoisting purposes, owned by George H. Turton & Son, bricklayers. Hydrostatic pressure, 150 pounds; working pressure allowed, 80 pounds to square inch. This boiler was condemned for new tubes and head; the work has been done and the boiler is in good condition. Expires June 6, 1891.

June 6.—No. 420. Horizontal tubular boiler in Lenman building, 1425 New York avenue, northwest, owned by J. T. Lenman. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires June 6, 1891.

June 6.—No. 421. Horizontal tubular boiler in the Richmond, Seventeenth and H streets, northwest, H. M. Cake, proprietor. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires June 6, 1891.

June 6.—No. 422. Vertical tubular boiler in printing office, G street between Fourteenth and Fifteenth streets, northwest, owned by George E. Lemon. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires June 6, 1891.

June 9.—No. 423. Locomotive form boiler in carpet cleaning works, Seventh street, southwest, owned by Chase & Bros. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds to square inch. Expires June 9, 1891.

June 9.—Nos. 424 and 425. Horizontal tubular boilers in Grand Army Building, Pennsylvania avenue between Fourteenth and Fifteenth streets, northwest, owned by G. G. Cornwell & Son. Hydrostatic pressure, 90 pounds; working pressure allowed, 60 pounds each to square inch. Expires June 9, 1891.

June 14.—No. 426. Vertical tubular boiler in dye works, 906 G street, northwest, owned by Anton Fischer. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires June 14, 1891.

June 14.—No. 427. Locomotive form boiler at Littlefield's Wharf owned by the Barber Asphalt Paving Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 85 pounds to square inch. Expires June 14, 1891.

June 16.—No. 428. Horizontal tubular boiler in Dexter Steam Laundry, corner Sixth and C streets, northwest, owned by H. M. Dexter & Co. Hydrostatic pressure, 140 pounds; working pressure allowed, 90 pounds to square inch. Expires June 16, 1891.

June 16.—No. 429. Horizontal tubular boiler in Small building owned by J. H. Small & Sons. Hydrostatic pressure, 115 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires June 16, 1891.

June 17.—No. 430. New return tubular boiler in Palace Steam Laundry, 113 Four-and-a-half street southwest, owned by W. F. Barker and E. Shepardson. Hydrostatic pressure, 130 pounds; working pressure allowed, 65 pounds, if necessary 80 pounds, to square inch. Expires June 17, 1891.

June 18.—No. 431. Vertical tubular boiler in printing office, 623 D street, northwest, owned by J. F. Sheiry. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires June 18, 1891.

June 18.—No. 432. Locomotive form boiler in printing office, 321 Four-and-a-half street, northwest, owned by J. P. Wright. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires June 18, 1891.

June 18.—No. 433. Horizontal tubular boiler in Small building. Hydrostatic pressure, 115 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires June 18, 1891.

June 19.—No. 434. Vertical tubular boiler in Georgetown Steam Laundry, 1269 Thirty-second street (West Washington), Georgetown, M. Newmyer, manager. Hydrostatic pressure, 150 pounds; working pressure allowed, 70 pounds, if necessary 100 pounds, to square inch. Expires June 19, 1891.

June 20.—No. 435. Vertical tubular boiler in bottling works, 703 and 705 North

Capitol street, owned by the Pabst Brewing Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires June 20, 1891.

June 20.—No. 436. Locomotive form boiler in wood and coal yard, 12 H street, northeast, owned by Kennedy Bros. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds to square inch. Expires June 20, 1891.

June 20.—No. 437. Vertical tubular boiler in warehouse, 50 and 52 H street, northeast, owned by H. P. Pillsbury. Hydrostatic pressure, 120 pounds; working pressure allowed, 65 pounds, if necessary 80 pounds, to square inch. Expires June 20, 1891.

June 23.—No. 438. Horizontal tubular boiler in mill, Virginia avenue, southwest, owned by James L. Barbour & Son. Hydrostatic pressure, 135 pounds; working pressure allowed, 80 pounds, if necessary 90 pounds, to square inch. Expires June 23, 1891.

June 23.—No. 439. Locomotive-form boiler in machine shop, Seventh street, southwest, owned by Forsberg & Murray. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds, if necessary 70 pounds, to square inch. Expires June 23, 1891.

June 23.—No. 440. Horizontal tubular boiler at Littlefield's Wharf (sidewalk plant), owned by the Barber Asphalt Paving Company. Hydrostatic pressure, 130 pounds; working pressure allowed, 80 pounds to square inch. Expires June 23, 1891.

June 24.—No. 441. Vertical tubular boiler in machine shop, Maine avenue, southwest, owned by E. N. Gray & Co. Hydrostatic pressure, 120 pounds; working pressure allowed, 70 pounds to square inch. Expires June 24, 1891.

June 24.—No. 442. Horizontal tubular boiler in Adams Express Company's building, Pennsylvania avenue, northwest. Hydrostatic pressure, 100 pounds; working pressure allowed, 40 pounds, if necessary 60 pounds, to square inch. Expires June 24, 1891.

June 24.—No. 443. Vertical tubular boiler used to run flying horses, owned by J. C. Kinsel. Hydrostatic pressure, 180 pounds; working pressure allowed, 110 pounds to square inch. Expires June 24, 1891.

June 25.—No. 444. Vertical tubular boiler in steam bakery, 420 Four-and-a-Half street, southwest, owned by Charles Schafer. Hydrostatic pressure, 110 pounds; working pressure allowed, 70 pounds to square inch. Expires June 25, 1891.

June 25.—No. 445. Vertical tubular boiler in wood and coal yard, First street and Virginia avenue, southwest, owned by Wm. A. Eliason & Co. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires June 25, 1891.

June 26.—No. 446. Vertical tubular boiler in steam bakery, 413 I street, northwest, owned by Charles Schneider. Hydrostatic pressure, 110 pounds; working pressure allowed, 70 pounds to square inch. Expires June 26, 1891.

June 26.—No. 447. Horizontal tubular boiler in Adams Express Company's building, Pennsylvania avenue, northwest. Hydrostatic pressure, 100 pounds; working pressure allowed, 40 pounds, if necessary 60 pounds, to square inch. Expires June 26, 1891.

June 27.—No. 448. Locomotive form boiler at 3216 Water street, northwest, owned by Potomac Stone Company. Hydrostatic pressure, 100 pounds; working pressure allowed, 60 pounds to square inch. Expires June 27, 1891.

June 27.—No. 449. Vertical tubular boiler at 3216 Water street, northwest, owned by Potomac Stone Company. Hydrostatic pressure, 120 pounds; working pressure allowed, 60 pounds, if necessary 80 pounds, to square inch. Expires June 27, 1891.

June 28.—No. 450. New horizontal tubular boiler in works Fifteenth and E streets, northeast, owned by the Hygienic Ice Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 105 pounds to square inch. Expires June 28, 1891.

June 30.—No. 451. Horizontal tubular boiler in machine shop Water street, Georgetown, northwest, owned by Beckham & Middleton. Hydrostatic pressure, 110 pounds; working pressure allowed, 60 pounds to square inch. Expires June 30, 1891.

June 30.—No. 452. Horizontal tubular boiler in the Washington Architectural Iron Works, Thirty-third and Water streets, northwest, owned by Edward L. Dent. Hydrostatic pressure, 120 pounds; working pressure allowed, 80 pounds to square inch. Expires June 30, 1891.

June 30.—No. 453. Horizontal tubular boiler in car stables Georgetown, northwest, owned by the Metropolitan Railroad Company. Hydrostatic pressure, 125 pounds; working pressure allowed, 80 pounds to square inch. Expires June 30, 1891.

June 30.—No. 454. New horizontal tubular boiler in works Fifteenth and E streets, northeast, owned by the Hygienic Ice Company. Hydrostatic pressure, 160 pounds; working pressure allowed, 105 pounds to square inch. Expires June 30, 1891.

Respectfully submitted.

J. H. WILKERSON,

Steam Boiler Inspector, District of Columbia.

The COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

REPORT OF SUPERINTENDENT OF SEWERS.

OFFICE OF THE ENGINEER COMMISSIONER.

Washington, D. C., November 15, 1890.

SIR: I have the honor to submit the following report of the operations of the sewer division for the year ending June 30, 1890, with estimates for the year ending June 30, 1892:

Appropriation for cleaning and repairing sewers and basins.....	\$35,000
Pipe sewers cleaned..... linear feet..	129,809
Brick sewers cleaned..... do.....	22,904
Pipe sewers taken up and relaid..... do.....	24
Brick sewers repaired..... do.....	220
Manholes constructed..... number..	5
Manholes repaired..... do.....	55
Manholes cleaned..... do.....	1,049
Receiving basin constructed..... do.....	1
Receiving basins repaired..... do.....	215
New covers placed on receiving basins..... do.....	7
Receiving basins cleaned..... do.....	39,284
Manhole covers reset..... do.....	117
Minor repairs to sewers..... do.....	369
Sand and gravel removed from pipe sewers and basins..... cubic yards..	8,783
Sand and gravel removed from main sewers..... do.....	2,262

The severe storms which occurred about the beginning of the fiscal year caused large deposits of sand, gravel, and silt in the northwest Boundary, Tiber, Missouri avenue, and B street sewers and made necessary a larger expenditure than usual for removing the same. As a result the more important repairs to the main sewers were of necessity deferred, and in addition it became necessary to reduce the cleaning and repair gangs during the latter months of the year.

It is expected that a large amount of repair work upon the Georgetown and Fourteenth street main sewers will be accomplished during the current fiscal year, and it is urged that the appropriation for the next fiscal year may be of such amplitude that the repairs necessary to these sewers may be completed. Many of the old brick sewers require renewal of their inverts. This work with the ordinary repairs to and cleaning of the large and rapidly expanding sewer system will require large expenditures each year. For the fiscal year 1891-'92 the amount required for cleaning and repairing sewers and basins is estimated at \$45,000.

Replacing obstructed sewers, appropriation, \$15,000. Under this appropriation there was constructed under contract 515.3 linear feet of 24-inch pipe sewers.

By day labor: 1,613 linear feet of 12-inch pipe sewers; 2,477 linear feet of 15-inch pipe sewers; 2,379 linear feet of 18-inch pipe sewers; 296 linear feet of 24-inch pipe sewers; 17 manholes.

There still remains a large number of pipe sewers constructed prior to 1874 which are defective from improper alignment, allowing deposits of sand, road detritus, etc., to accumulate, and open joints allowing roots of trees to intrude and expand. These defective portions of the sewer system are brought to the notice of the office when the obstruction becomes sufficient to cause complaints or are discovered in the performance of the operations of the flushing, repairing, and constructing gangs of the sewer division. The experience of the sewer division leads to the belief that it will be necessary to replace all of the old pipe sewers with those of proper construction carefully laid. Twenty-five thousand dollars can be profitably expended upon this work during the fiscal year 1891-'92.

MAIN AND PIPE SEWERS.

Appropriation.....	\$90,000
Under this appropriation there was constructed under contracts—	
12-inch pipe sewers..... linear feet..	8,425.9
15-inch pipe sewers..... do.....	5,294.9
18-inch pipe sewers..... do.....	990.3
24-inch pipe sewers..... do.....	1,172
2.5 by 3.75 feet brick and concrete sewers..... do.....	1,409.2
2.75 by 4.125 feet brick and concrete sewers..... do.....	1,499.2
2.75 by 4.125 feet brick sewers..... do.....	2,066.3
3.5 by 5.25 feet brick sewers..... do.....	307
3 feet diameter circular brick sewers..... do.....	1,373.4
3 by 4.5 feet brick sewers..... do.....	371.5
Basin connections..... do.....	1,139
Receiving basins..... do.....	55

The following described work was performed by day labor:

6-inch pipe sewers	linear feet..	132
8-inch pipe sewers	do.....	220
12-inch pipe sewers	do.....	4,629
15-inch pipe sewers	do.....	426
18-inch pipe sewers	do.....	359
21-inch pipe sewers	do.....	27
24-inch pipe sewers	do.....	1,032
Receiving basins		48

ESTIMATES FOR MAIN AND PIPE SEWERS FOR 1891-'92.

Lower Rock Creek intercepting sewer. (To intercept sewage, at present discharged into Rock Creek, and convey the same to deep water in the river.)	\$228,000
Sewer on H street, northeast, between Seventh street and Florida avenue. (To relieve overcharged sewers between Seventh street and Florida avenue and to properly drain the low area between Sixth, Eighth, G, and I streets, northeast.)	41,000
Sewer on B street, northeast, between Eleventh street and Tennessee avenue. (To divert sewage and drainage, now carried by the Eighth street system, to the Tennessee avenue sewer.)	3,400
Sewer on Fourteenth street, southeast, from a point between K street and Pennsylvania avenue northward. (This sewer will be the main drain for the extreme southeastern section of the city.)	10,000
Sewer on Sixth street, southeast, between I and K streets. (To replace a portion of the defective sewer on this street.)	3,000
Sewer on C street, northwest, between First street and New Jersey avenue. (To relieve the overcharged pipe system on this street.)	2,100
Terra cotta pipe sewers	50,000
Receiving basins	10,000
Total	347,500

SUBURBAN SEWERS.

Appropriation	\$50,000
Under this appropriation there was constructed under contracts—	
12-inch pipe sewers	linear feet.. 2,975
18-inch pipe sewers	do..... 907.5
24-inch pipe sewers	do..... 700
2.5 by 3.75 feet brick and concrete sewers	do..... 556
3 by 4.5 feet brick and concrete sewers	do..... 1,351
3.25 by 4.875 feet brick and concrete sewers	do..... 1,437.4
2.75 by 4.125 feet brick sewers	do..... 1,223.6
7.64 feet diameter circular concrete sewer	do..... 581.1
The following described work was performed by day labor:	
12-inch pipe sewers	linear feet.. 351
15-inch pipe sewers	do..... 341
18-inch pipe sewers	do..... 472
21-inch pipe sewers	do..... 699
24-inch pipe sewers	do..... 51
Manholes	14
Receiving basins	6

ESTIMATES FOR SUBURBAN SEWERS FOR 1891-'92.

Sewer on Navy Place between Nichols avenue and river (to provide a main outlet for the watershed draining to Nichols avenue and Navy Place)	\$2,700
Sewer in Eckington valley between Q and R streets (continuation of the main sewer in this valley)	6,000
First street extended, between U and W streets with branches on V and W streets (continuation of the main sewer in First street valley)	17,350
Sewer on Spring road from Piney branch eastward (to provide a main drain for the Spring road valley)	6,500
Rock Creek valley sewer, between Lyon's Mill and Quarry road (continuation of the Rock Creek sewage interceptor to Quarry road in the National Zoological Park.)	54,000

Sewer on Sherman avenue from the north end of sewer as constructed to Mt. Pleasant avenue (to permit the improvement of the roadway of Sherman avenue and to provide an outlet for sewage from the locality adjacent to Brightwood avenue and Rock Creek Church road).....	\$7,840
Terra cotta pipe sewers	15,000
Receiving basins.....	3,000
Total.....	112,390

PERMIT SEWERS.

Allotment from the appropriation for permit work.....	\$35,000
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Constructions under the permit and compulsory systems.

6-inch pipe sewers.....linear feet..	1,091
8-inch pipe sewers.....do....	3,561
12-inch pipe sewers.....do....	28,328.5
15-inch pipe sewers.....do....	398.5
18-inch pipe sewers.....do....	226.5
2.5 by 3.75 feet concrete sewers.....do....	75
Manholes	291
Receiving basins.....	26
Cost of the above work to property owners	\$24,464.41
Cost of the above work to the District of Columbia.....	24,464.43
Total cost	48,928.84
Amount returned to depositors	858.32

In addition to the above, work was performed at the cost in full of applicants as follows:

8-inch pipe sewers.....linear feet..	624.5
12-inch pipe sewers.....do....	141
15-inch pipe sewers.....do....	51
Manholes	16
Total cost	\$1,057.46
Amount returned to depositors	227.79

I respectfully recommend an appropriation of \$35,000 for the construction of sewers under the permit and compulsory systems.

GAUGING SEWERS AND RAINFALL.

An appropriation of \$3,000 for gauging sewers and rainfall was included in the appropriation bill for the current fiscal year, under which gauges are being constructed and accurate maps of drainage areas are being prepared. The gauges will be erected and all preparations completed in time to record the storms of next spring. This work to be of value must extend over several years and an appropriation of \$2,500 is requested for the next fiscal year.

CONDEMNATION OF RIGHT OF WAY TO CONSTRUCT, MAINTAIN, AND REPAIR SEWERS.

It is not always found practicable to locate main sewers within lines of public streets and roads or upon public ground, and to secure the rights of way, when it shall become necessary to construct sewers upon private properties, as well as to acquire the right to maintain certain sewers constructed upon private properties by the board of public works, an appropriation of \$15,000 is asked.

SEWAGE DISPOSAL.

A report upon the subject of sewage disposal was presented in February last, in which a system of intercepting sewers for conveying the sewage to deep water was proposed, the sewage from the greater portion of the sewer district to be discharged into the river by gravity, and that from the low area to be raised by pumps before its discharge. The drainage from the low area was to be pumped also, and the low area was to be protected from high water in the river by dikes suitably located. By authority conferred by a clause in the appropriation bill for the year 1889-'90, the

President of the United States appointed as a board to consider the subject of the sewerage system of the District, Messrs. Radolph Hering, S. M. Gray, and F. P. Stearns, and their report presented in July last proposed a scheme similar in details and in the general result to be accomplished, viz, the discharge of the sewage into deep water in the river, the only material variation being that the sewage from the whole system was to be discharged at Magazine Point, whereas the scheme presented by me proposed the discharge of the sewage at three points, viz, the foot of Potomac street, a point near Easby's Point, and a point a short distance below Long Bridge.

Magazine Point is a good location for the outlet of the sewer system if all the sewage is to be discharged at one place, and probably better results would be accomplished by its discharge there, when the population becomes dense, than if it were discharged at the points suggested in the report of February last. The cost of the Magazine Point scheme will exceed by a considerable amount the scheme proposing three discharge points. The improvement of the sewerage system is a subject of the greatest importance to this community and measures should be taken to secure its betterment at an early date. To meet this result provision should be made to secure the necessary funds in order that work may be commenced upon a large scale at the earliest possible moment.

SEWER DIVISION.

Attention is again called to the necessity for making provision in the appropriation bill for those employes of the sewer division who by their duties are really permanent, although carried on a temporary roll, and whose services are so general in character that it is very difficult to apportion their salaries among the appropriations. No increased expense will be incurred by the District, as the force estimated for below is no greater than the force required by the sewer division and which will be employed and paid for from the sewer appropriations if special provision as requested is not made.

SEWER DIVISION SALARIES.

Superintendent of sewers	\$2,400
General inspector	1,500
2 assistant engineers	3,000
1 draughtsman	1,500
1 leveler	1,200
3 rodmen	2,340
3 axmen	1,950
2 clerks	2,400
1 clerk	1,000
2 inspectors of property	1,868
2 sewer tappers	2,000
Permit clerk	1,200
Assistant permit clerk	939
Total	23,297

Your attention is called to the inadequate accommodations provided for the office force. These quarters are neither comfortable, convenient, nor adapted to the preservation, inspection, and use of the records pertaining to the sewer work of the District.

I respectfully transmit the following appendices:

A—Details of contract work, "replacement of obstructed sewers."

B—Details of day labor work, "replacement of obstructed sewers."

C—Details of contract work, "main and pipe sewers."

D—Details of day labor work, "main and pipe sewers."

E—Details of contract work, "construction of suburban sewers."

F—Details of day labor work, "construction of suburban sewers."

G—Details of compulsory and permit sewer work.

H—List of inspectors, sewer division.

Respectfully submitted.

D. E. McCOMB,
Superintendent of Sewers.

The ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

REPORT OF SUPERINTENDENT OF LAMPS.

WASHINGTON, D. C., *October 15, 1890.*

COLONEL: I have the honor to submit the following report of the operations of the Division of street lighting during the fiscal year ended June 30, 1890.

The receipts from all sources on account of street lighting amounted to \$157,762.58, the expenditures \$156,935.94, leaving a balance of \$826.64.

The following statements show in detail the receipts and expenditures on account of street lighting, under the respective divisions, as prescribed in the appropriation :

Receipts and expenditures on account of street-lighting during the fiscal year ended June 30, 1890.

No.	Receipts.	Amount.	Date.	Expenditures.	Amount.
89.			1890.		
1	To appropriation.....	\$115,000.00	June 30	By Washington Gaslight Co., for street-lighting to date.....	\$93,425.09
	Baltimore and Potomac R. Co., amount refunded.	1,816.40		Georgetown Gaslight Co., for street-lighting to date.....	8,715.00
	Baltimore and Ohio R. R. Co., amount refunded.....	946.18		Wheeler Reflector and Light Co., for street-lighting to date.....	5,157.35
				Washington Gaslight Co., for erecting and moving lamps.....	3,037.83
				Georgetown Gaslight Co., for erecting and moving lamps.....	183.10
				Geo. White & Sons, for purchase of lamp-posts, etc....	4,219.00
				Wheeler Reflector and Light Co., for purchase of lanterns.....	1,287.70
				H. I. Gregory, for purchase of street designations....	35.40
				Pay rolls, erecting posts for oil-lamps.....	98.25
				W. L. Cash, payment for lantern destroyed by District of Columbia employees.....	3.25
				W. Walter, for altering photometer.....	3.00
				Balance.....	1,597.61
	Total.....	117,762.58		Total.....	117,762.58

Receipts and expenditures on account of electric street-lighting, during the fiscal year ended June 30, 1890.

Date.	Receipts.	Amount.	Date.	Expenditures.	Amount.
1889. July 1	To appropriation.....	\$40,000.00	1890. June 30	By United States Electric Lighting Co., for street lighting to date	\$33,272.14
				Expenses of inspection:	
				McDermott Bros.....	48.00
				L. G. Stanhope	434.00
				W. F. Hewitt.....	4.00
				Danehower & Co.....	104.00
				Lutz & Bros.....	37.00
				Myers & Loving.....	4.00
				A. G. McKenzie.....	8.00
				O'Neill Bros.....	4.00
				John Lynch.....	22.00
				M. Lindsay.....	4.00
				F. Stillson.....	4.00
				Judd & Detweiler.....	16.00
				John Miller.....	37.00
				C. B. Robinson.....	3.00
				Balance.....	2.00
	Total.....	40,000.00		Total.....	40,000.00

During the year 365 new gas lamps were erected as follows:

Northwest	9
Northeast	2
Southeast	2
Southwest	1
Georgetown	1
Suburban roads and streets.....	2

Total..... 30

The experiment of lighting with oil lamps those sections of the city unsupplied with gas mains has been continued, and the system continues to give entire satisfaction.

During the year 194 additional oil lamps were erected, making the total number in service on June 30, 360. This increase was divided among the sections of the city as follows:

Northwest.....	1
Northeast.....	1
Southeast.....	1
Southwest.....	1
Suburban roads and streets.....	1

Total..... 5

Lincoln avenue from Florida avenue to Glenwood Cemetery, Bennings road from Fifteenth street east to Bennings Bridge, Nichols avenue from Morris road to S Elizabeth Insane Asylum, and Champlain avenue from Florida avenue to Columbia road are the suburban roads on which these lamps are used.

The gas and oil lamps were lighted 2,600 hours during the year, as required by law as follows:

Month.	Schedule.	Extra.	Total.
1889.	H. M.	H. M.	H. M.
July	153 15	7 45	161
August	164 30	27 45	192
September	180 15	44 30	224
October	210 45	42 45	253
November	216 45	39 30	256
December	229 30	41 30	271
1890.			
January	230 30	38 45	269
February	189 45	65 00	254
March	174 45	47 00	221
April	154 45	29 00	183
May	141 00	31 30	172
June	121 00	18 15	139
Total	2,166 45	493 15	2,660

The electric lights were lighted 4,292 hours during the year.

The sum of \$386.77 was deducted from the various contracting companies for non-illumination during the year, as follows:

Company.	No. of hours.	Amount.
United States Electric Lighting Co.....	6,980	\$349.01
Washington Gaslight Co.....	461	9.21
Georgetown Gaslight Co.....	710	14.20
Wheeler Reflector and Light Co.....	287	14.35
Total.....	8,438	386.77

The following statement shows the number of lamps of all kinds maintained under contract by the District of Columbia:

Kind.	In service.		Increase.
	July 1, 1889.	June 30, 1890.	
Gas lamps.....	4,817	5,225	408
Oil lamps.....	171	360	189
Electric arc lamps.....	177	195	18
Total.....	5,165	5,780	615

Attention is called to the urgent necessity of increasing the number of hours of street-lighting to 3,200 hours. Frequent complaints are made because the streets are occasionally left in darkness when unforeseen storms arise at times when the moon is relied on for light. The strictest economy must be observed to make the 2,600 hours now allowed cover the entire year.

The service of all the contracting companies has been much improved during the year, the officials of each company promptly responding to every request made upon them for any new method which would increase the efficiency of the service.

The United States Electric Lighting Company now has all its wires underground, and the service, which maintain public lamps, compares with that of any other city in the country.

The business of this division has increased to such an extent that an increase of force is absolutely necessary. At present one man is compelled to perform all the office work and outside duties, including night inspections. In other cities these duties are divided among a number of employes, and I respectfully recommend that at least two inspectors be provided for in next year's appropriation.

The continued growth of the city will require the erection of at least 500 additional gas and oil lamps during the fiscal year 1891-'92, and the following estimates are based upon such contemplated increase and present contract prices of materials:

ESTIMATES FOR STREET LIGHTING, 1891-'92.

Maintenance of 6,300 lamps one year.....	\$126,000.00
Maintenance of 500 new lamps six months.....	5,000.00
Purchase of lamp-posts.....	3,000.00
Purchase of lanterns.....	2,500.00
Painting, street designations, etc.....	1,500.00

Total for gas and oil lamps..... 138,000.00

Requests for the extension of the electric-lighting system along Fourteenth street, west, from New York avenue to Florida avenue, have been made, and should this be done the amount required for electric lighting for the ensuing year will be as follows:

Maintenance of 206 lights (number under contract for current year) and necessary expenses of inspection.....	\$46,000.00
Maintenance of 30 additional lights on Fourteenth street, west.....	7,000.00

Total for electric lights..... 53,000.00

Amount required for gas and oil lamps..... 138,000.00

Total for street lighting..... 191,000.00

Should the number of hours of lighting for gas and oil lamps be increased to 3,200 hours as recommended above, the amount required for such increase will be \$20,153, making the total appropriation for the ensuing year \$211,153.

Very respectfully,

W. H. HARRISON,
Superintendent of Lamps.

The ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

REPORT OF THE INSPECTOR OF ASPHALT AND CEMENTS.

WASHINGTON, *October 1, 1890.*

COLONEL: I have the honor to submit my fourth annual report upon the the operations of this office.

The material which has been examined and reported upon during the past year may be classified as follows:

Material for concrete pavements:

Asphalt:	
Crude	13
Refined	15
Oiled	367
Residuum oils	28
Coal-tar paving cement No. 4	10
Surface mixtures	243
Sands, stones, stone dust, limestone, etc	20
	696

Hydraulic cements:

Natural: Brands 12, lots 241, samples	3, 010
Portland: Brands 17, lots 34, samples	198
	3, 208

Waters:

Water department; pumps	77
Aqueduct	38
Health office	23
Miscellaneous	34
	172

Police headquarters	4
Miscellaneous	53

Total 4, 133

In carrying out this large amount of work the expenditure of chemicals and apparatus is necessarily large, and in consequence at least \$500 will be required for unavoidable needs during the coming year, and \$1,000 could be used to advantage.

WATERS.

The well waters examined during the past year have shown very much the same characteristics as those of previous years. In my last report I entered at such length into methods of analysis and interpretation of results that it seems unnecessary to repeat here my previous conclusions, except in a condensed form.

Free and albuminoid ammonia point to the presence at some time or other of organic matter, free ammonia being derived from the decomposition and albuminoid ammonia from undecomposed organic matter. If the oxygen consumed is low, chlorine abnormally high, and, in the case of wells nitrates high, the organic matter is probably of animal origin, while with oxygen consumed high and chlorine low, vegetable matter may be the source.

Nitrites are evidences of decomposition going on at the time of their presence. They form good ground for condemnation or suspicion when found in more than traces. Nitrates in the same way point to an origin in the decomposition of organic matter which is completed, and are also grounds for suspicion when found in larger amount than the local standard of purity will admit.

The ground water of any locality, where not subject to any immediate contamination, will in different wells be found to approach an average composition, which may be called the local standard. From a large number of analyses made in previous years, standards of this description have been determined for different sections of the

District. For reference in the interpretation of the analyses which are here reported these standards are repeated :

	Solids.	Ammonia.		Oxy- gen cons.	Nitrogen as—		Chlo- rine.
		Free.	Albu- minoid.		Ni- trites.	Ni- trates.	
Northwest section	278	.012	.064	.60	trace.	12.7	54.4
Northeast	265	.028	.124	1.54	trace.	24.0	31.8
Southwest	566	.008	.048	.88	.000	28.0	111.0
Southeast	242	.015	.071	.79	.000	12.1	60.2
County	133	.020	.066	.67	.000	4.1	18.5

The above averages refer only to wells suffering from no immediate contamination, and may be considered as the composition of an average uncontaminated well, for each section.

The averages for waters in wells which are not above suspicion were found to be—

	Solids.	Ammonia.		Oxy- gen cons.	Nitrogen as—		Chlo- rine.
		Free.	Albu- minoid.		Ni- trites.	Ni- trates.	
Northwest	478	.429	.135	1.56	.069	20.0	91.1
Northeast	523	.165	.163	1.72	.082	24.1	114.6
Southwest	587	.239	.151	1.77	.059	18.8	114.4
Southeast	659	.314	.222	1.56	.017	34.2	113.6
County	165	.060	.123	1.48	.039	5.8	27.7

Seventy-five per cent. of the wells averaged above were suspicious, and the differences between the contaminated and uncontaminated wells and between different sections of the same class is very striking, the less densely populated sections showing a marked decrease in the amount of pollution.

With such a basis of reference the analyses of the past year may be studied.

Analyses of well waters.

[Results in parts per million.]

Serial number.	Location.	Date.	Condition.	Ammonia.			Oxygen consumed.	Nitrogen as—			Character.
				Solids.	Free.	Albuminoid.		Nitrites.	Nitrates.	Chlorine.	
NORTHWEST SECTION.											
		1889.									
2519	Twelfth and O	Sept. 30	Turbid.	332	6.560	1.080	8.30	.020	0.0	32.5	Bad.
2534	Fifth and Ridge	Oct. 7		460	.040	.188	.50	.020	35.0	87.0	Suspicious.
2598	do	Oct. 21		466	.012	.100	.50	trace	32.0	89.5	Passable.
2536	Third and Indiana avenue.	Oct. 7		392	.020	.152	.06	.024	15.0	72.5	Suspicious.
2538	Twelfth and Bound- ary.	Oct. 7		66	.008	.020	.22	.000	3.0	6.5	Good.
2539	Tenth, between T and U.	Oct. 7		780	.228	.200	.90	.360	38.0	139.0	Bad.
2570	Twenty-third and New York ave- nue.	Oct. 14		244	.304	.100	.44	.065	15.0	19.0	Do.
2596	Eighth, between G and H.	Oct. 21		380	.620	.100	.78	.020	15.0	62.5	Do.
2723	Pound	Nov. 25		244	.004	.160	.76	.000	18.0	22.5	Good.
2724	New York avenue, between Seven- teenth and Eighteenth.	Nov. 25		566	.040	.184	2.30	.025	48.0	99.0	Suspicious.
1890.											
2886	do	Jan. 21			.132	.360	1.22	.004	27.0	93.5	Do.
2895	do	Jan. 28		555	.060	.212	1.18	trace	28.0	91.5	Passable.

Analyses of well waters.

[Results in parts per million.]

Serial number.	Location.	Date.	Condition.	Solids.	Ammonia.		Oxygen consumed.	Nitrogen as—		Chlorine.	Character.
					Free.	Albuminoid.		Nitrites.	Nitrates.		
NORTHWEST SECTION—continued.											
2888	1419 New York avenue.	1890. Jan. 21	.....	.....	4.080+	.520	4.60	.200	70.0	37.5	Bad.
2896	New Jersey avenue, between L and M.	Jan. 28	.....	564	.400	.672	8.36	.075	15.0	137.5	Do.
2907	2306 Sixth.	Feb. 4	.....	144	.060	.204	1.68	.005	7.0	11.0	Passable.
2980	F, between First and Second.	Feb. 24	.....	1270	.032	.120	.42	trace	48.0	245.0	Bad.
2994	do	Mar. 11	.....	.....	.012	.088	.36	.002	35.0	244.5	Do.
2981	Massachusetts avenue, between First and North Capital.	Feb. 24	.....	811	.012	.112	.42	.008	25.0	189.0	Suspicious.
2993	do	Mar. 11	.....	.....	.100	.128	.50	.005	28.0	189.5	Do.
3018	Seventh and H.	Mar. 25	.....	380	.212	.192	.42	.008	15.0	76.0	Bad.
3077	do	Apr. 22	.....	336	.104	.104	.50	.005	15.0	74.5	Do.
3151	do	May 27	.....	.....	.....	.....	.....	.008	.....	74.5	Do.
3258	do	July 15	.....	442	.212	.072	.....	.240	.....	82.5	Do.
3471	do	Sept. 30	.....	366	.192	.032	1.04	.110	6.0	74.5	Do.
3065	Tenth, W and L	.....	.....	400	.228	.252	.82	.038	25.0	65.5	Do.
3202	Sixth, between F and G.	June 17	.....	504	.140	.112	.04	.015	25.0	74.5	Suspicious.
3231	Third and R streets.	July 2	.....	168	.012	.060	.26	trace	8.0	17.0	Good.
3235	C, between Twenty-first and Twenty-second.	July 2	.....	1,294	.892	.412	3.64	.065	35.0	172.5	Bad.
3256	do	July 15	.....	.....	.....	.....	.....	.240	.....	133.0	Do.
3255	Sixteenth and Corcoran.	July 15	.....	186	.032	.072	.28	.000	2.0	26.0	Good.
3323	480 Louisiana avenue.	.....	.....	87	.192	.112	.70	.038	1.6	9.0	Suspicious.
3324	215 E	Aug. 5	.....	514	.100	.320	2.04	.000	trace	147.5	Suspicious; chalybeate.
3335	G street and North Capitol.	Aug. 12	.....	512	.132	.292	.48	.125	11.0	110.0	Bad.
3354	do	Aug. 19	.....	362	.292	.360	1.98	.045	6.0	79.0	Bad; cleaned
3382	do	Aug. 26	.....	402	.232	.684	2.90	.025	6.0	70.0	Do.
3380	G street and First	Aug. 26	.....	131	trace.	.060	.....	.22	trace	5.0	Good.
3336	Third and L	Aug. 12	.....	411	trace.	.100	.10	.000	15.0	63.6	Do.
3379	Louisiana avenue, Ninth and Tenth.	Aug. 26	Milky	148	.280	.280	3.56	.000	.0	11.2	Suspicious.
3414	404 Fifteenth street.	Sept. 9	.....	159	.752	.500	2.16	.068	5.0	32.5	Bad.
3430	Thirty-second and Thirty-fourth streets.	Sept. 16	.....	307	.001	.060	.16	trace	trace	7.5	Good.
3457	O, between Thirty-first and Thirty-second.	Sept. 23	.....	231	.032	.280+	.22	trace	19.2	34.0	Suspicious.
SOUTHWEST SECTION.											
2568	First, between N and O.	Oct. 14	.....	540	.860+	.880+	1.24	.020	25.0	82.5	Bad.
2597	Fourteenth and B	Oct. 21	.....	324	.052	.112	1.10	.032	8.0	106.0	Suspicious.
2887	Eighth and G	Jan. 21	.....	.....	.180	.240	3.00	.015	38.0	209.0	Do.
2955	One-half, between N and O.	Feb. 11	Turbid	420	.160	.628	2.76	trace	25.0	102.5	Do.
2995	do	Mar. 11	Cloudy	.....	.188	.096	1.02	trace	38.0	111.5	Do.
3005	do	Mar. 18	Clear	497	.172	.320	1.52	trace	28.0	107.5	Do.
3063	do	Apr. 14	Milky	478	.140	.372	1.36	trace	23.0	91.6	Do.
3062	K, between Third and Four-and-a-half.	Apr. 14	Clear	811	.152	.400	.66	.032	25.0	173.0	Bad.
3089	do	Apr. 29	do	896	.108	.332	1.06	.005	15.0	182.5	Suspicious.
3121	do	May 13	Slightly turbid.	.....	.240	.292	1.50	.012	25.0	177.5	Do.
3138	do	May 20	Turbid	.....	.....	.....	.....	.015	.....	177.5	Do.

Analyses of well waters—Continued.

[Results in parts per million.]

Location.	Date.	Condition.	Solids.	Ammonia.		Oxygen consumed.	Nitrogen as—		Chlorine.	Character.
				Free.	Albuminoid.		Nitrites.	Nitrates.		
SOUTHWEST SECTION—cont'd.										
22 D. between Ninth and Tenth.	1890. May 27	.....	520	.012	.272	2.58	trace	25.0	84.0	Suspicious.
33 do.	June 10	.....	405	.300	.152	.44	.018	28.0	69.0	Bad.
31 do.	June 17	.....	140	.108	.38	.38	.008	28.0	76.0	Suspicious.
33 do.	July 2	.....	112	.112	.34	.008	.38	70.5	Do.	Do.
34 do.	July 15	.....	125	.125	.69.5	.125	.69.5	Do.	Do.	Do.
34 Second and D.	June 3	.....	1027	.560	.216	1.30	.015	28.0	307.0	Do.
36 411 Thirteen-and-a-half.	Sept. 2	Slightly cloudy.	1127	.108	.200	.50	.035	15.0	225.0	Do.
SOUTHEAST SECTION.										
25 Third and M.	Sept. 16	.....	438	.000	.112	.28	.005	8.0	41.5	Passable.
59 First and O.	Sept. 23	Turbid.	400	.060	.112	1.90	.300	4.0	113.5	Bad.
35 do.	Oct. 7	.....	238	.146	.168	.70	trace	3.0	59.0	Passable.
37 do.	Oct. 14	.....	246	.100	.260	.50	.000	trace	59.5	Do.
61 Fourth and North Carolina ave.	Sept. 23	.....	295	.008	.020	.24	.000	25.0	39.0	Good.
63 First and M.	Dec. 31	Milky	376	.060	.052	.66	.005	6.0	91.0	Passable.
33 Washington Asylum	Mar. 17	Turbid	134	.020	.060	.10	trace	.0	11.5	Good.
34 Seventeenth and Georgia ave.	Mar. 18	.....	162	.102	.112	.42	trace	12.0	32.5	Passable.
39 North Carolina avenue, between First and Second.	Apr. 1	.....	360	.200	.152	.70	trace	25.0	74.0	Do.
8 N. between New Jersey avenue and First.	Apr. 29	.....	612	.060	.162	.56	.008	18.0	159.0	Suspicious.
9 Seventeenth and A	May 20	.....	163	.020	.100	.44	.005	8.0	24.0	Passable.
2 Twelfth, between D and E.	July 2	Organic odor.	376	.020	.072	3.08	.000	12.0	69.5	Do.
3 do.	July 15	.....	378	.....	.....	.....	.....	.....	72.5	.....
4 Sixth and B.	July 15	Odor	370	trace.	.040	.26	trace	8.0	57.5	Do.
2 Third and C.	July 29	.....	443	.020	.216	2.70	.005	28.0	109.0	Suspicious.
5 do.	Aug. 5	.....	.....	.060	.264	2.38	.000	25.0	89.0	Do.
7 do.	Aug. 12	.....	360	.048	.240	2.18	trace	15.0	84.5	Do.
7 do.	Sept. 2	.....	207	.020	.204	3.16	trace	5.0	34.0	Do.
6 Second and C.	Aug. 19	(*)	.....	.....	.....	.....	.....	.....	.....	.....
2 do.	Sept. 16	Clear	90	.008	.320	.30	.005	3.0	36.0	Do.
1 Ninth and South Carolina ave.	Aug. 26	Cloudy	322	.280	.060	.24	trace	18.0	55.2	Do.
8 do.	Aug. 2	.....	336	.001	.141	.36	trace	6.0	47.5	Passable.
1 Fourth and South Carolina ave.	Aug. 16	Cloudy	220	2.000+	.280+	.30	trace	15.0	44.0	Bad.
6 do.	Aug. 23	Slightly cloudy.	211	trace.	.240	.36	trace	8.0	37.5	Passable.
40 Eighth and A.	Aug. 30	.....	260	.020	.020	.46	trace	15.0	42.5	Do.
NORTHEAST SECTION.										
39 Fifth and A.	1890. Feb. 24	.....	350	.048	.020	.24	.005	28	44.0	Passable.
34 Twelfth and E.	June 10	Turbid	302	.060	.280	2.10	Tr.	25	22.5	Suspicious.
30 do.	June 17	.....	.....	.012	.096	1.62	Tr.	25	24.0	Passable.
33 Ninth and A.	Aug. 19	.....	167	Trace	.061	.22	Tr.	5	34.0	Good.
COUNTY.										
40 Fort Myer	1889. Oct. 8	.....	72	.000	.212	.16	.020	2.8	16.0	Good; driven wells.
41 Sheridan avenue.	Oct. 28	.....	530	.012	.142	1.10	.015	45	87.5	Bad.
42 Howard avenue.	Oct. 28	.....	83	1.40	.420	1.62	.140	2	15.5	Do.
38 Seventh and Whitney.	Nov. 18	.....	180	.104	.228	.08	.015	8	34.0	Suspicious.
35 Klinge Ford	Dec. 31	.....	76	.060	.140	3.12	Tr.	Tr.	3.0	Passable.
38 Anacostia	1890. Jan. 7	.....	.....	1.640+	.132	9.20	.875	(*)	39.5	Bad; 308 Filmore st.
39 Superior	Feb. 17	.....	104	.142	.184	.42	.025	5	12.5	Bad.

* Too filthy for analysis.

Analyses of well waters—Continued.

[Results in parts per million.]

Serial number.	Location.	Date.	Condition.	Solids.	Ammonia.		Oxygen consumed.	Nitrogen as—		Chlorine.	Character.
					Free.	Albuminoid.		Nitrites.	Nitrates.		
COUNTY—cont'd.											
		1890.									
2970	Roanoke.....	Feb. 17	.....	148	.240	.908	2.70	.270	3	30.5	Bad.
3228	Brightwood.....	July 2	.....	243	1.760+	.972	(*)	.000	.0	37.5	Bad; H. O. 529.
3229	do	July 2	.....	108	.008	.072	.32	.000	3	12.5	Good; H. O. 530.
3383	900 Irvin street...	Aug. 26	.....	176	1.008	.340	2.64	.028	8	29.2	Bad; H. O. 536.
3384	Georgetown	Aug. 26	.....	30	.142	.160	1.50	Tr.	5	2.4	Good: cistern.
3415	Olivet street	Sept. 9	.....	375	1.240	1.220	7.24	.000	.0	77.5	Bad.
SPRING.											
		1889.									
2460	Harrison avenue..	Sept. 23	.....	42	.020	.060	.30	.000	3	7.5	Good.
2571	Eleventh and C streets NE.	Oct. 14	.....	364	.008	.192	.38	Tr.	28	39.0	Passable.
2859	Fairfax, Va.....	Nov. 25	.....	48	13.420	1.000	1.36	Tr.	.02	4.5	Bad.
		1890.									
3056	Franklin Square..	Apr. 14	.....	310	.100	.120	.06	.000	4.5	52.5	Good.
3350	Brightwood.....	Aug. 19	.....	69	.012	.052	.10	Tr.	3.5	17.5	Do.
CISTERNS.											
		1890.									
3304	Dr. Tyndal	July 22	.....	116	.052	1.920	(*)	Tr.	1.5	6.0	Bad.
3433	H. H. Dodge	Sept. 16	.....	90	.012	.141	.20	Tr.	.0	4.0	Good.

* Large.

The preceding results show that in the northwest over 71 per cent. of the wells were either bad or suspicious; in the southwest all were bad or suspicious; in the northeast two out of three; in the southeast 40 per cent.; and in the county 70 per cent.

This is certainly a very poor showing for the wells of the District, and might prove a dangerous one in case of an epidemic. The only argument in favor of keeping them open is the filthy condition of the Aqueduct water and the high temperature which it reaches in the mains in summer, often 85°, which is far from palatable to the poorer classes, who are unable to purchase ice.

The analyses of the spring and cistern waters need no comment; but as an example of the possible purity of spring water from a rocky mountainous locality, entirely removed from populated localities and any sources of contamination, the analysis of the following spring water from the mountains of Virginia is remarkable, and with this may be compared that of the deep well in the Columbia gravels reported last year:

	Deep well.	Mountain spring.
Solids	174.	19.
Free ammonia .....	.000	.075
Albuminoid ammonia .....	.020	.01
Oxygen consumed .....	.22	.30
Nitrogen as—		
Nitrites .....	.000	.00
Nitrates .....	.0	.3
Chlorine	4.0	4.5

In conclusion I have again to call attention to the fact that too much dependence must not be placed on the chemical analysis of well waters alone in judging of their suitability for drinking purposes. Information in regard to the source and environment is of greater importance and without due consideration of their effect upon the character any water analysis may be very deceptive. In a proper combination, however, of all the available evidence the chemical data may form an important part, especially when referred to such local standards as have been established.

WELLS FILLED AND ABANDONED.

As the result of the analyses and other evidence as weighed by those to whom it was submitted the following 17 wells have been filled and abandoned:

Fifth and Q streets, NW.
Third and R streets, NW.
Eighth, between G and H streets, NW.
Third, between G and H streets, NW.
Eighth and G streets, SW.
One-half, between N and O streets, SW.
Second and D streets, SW.
Fifth, between G and H streets, SE.
New Jersey avenue, between L and M streets, SE.

310 Pomeroy street, NW.
R, between New Jersey avenue and Fifth street, NW.
Twelfth and O streets, NW.
Four-and-a-half and M streets, SW.
Four-and-a-half and T streets, SW.
K, between Third and Four-and-a-half streets, SW.
Seventh and I streets, NE.
Ninth, between G and I streets, SE.

These wells had been proved to be contaminated without doubt, and constituted about half of all which were not above suspicion.

The pump division also records cleaning 31 wells, erecting 25 new pumps, and moving 5 to the curb line.

AQUEDUCT WATER.

The very variable and at times inferior nature of the water supplied through the mains has led me to its analyses at intervals, as drawn from the tap in the laboratory of this office. These results have been reported to the Assistant to the engineer Commissioner, and to the health officer of the District. For the past year they are as follows:

Analyses of Aqueduct water.

Serial No.	Date.	Condition at distribution reservoir.	Condition at Great Falls.	Rainfall for seven days.	Total solids.	Free ammonia.	Albuminoid ammonia.	Oxygen consumed.	N. as nitrites.	N. as nitrates.	Chlorine.
1889.											
2462	Sept. 23	25	30	2.04	120	.004	.164	1.58	.000	.5	4.5
2520	Sept. 30	36	36	1.17	122	Trace	.386	1.90	.000	.8	5.0
2537	Oct. 7	(*)	36	.24	119	.004	.306	1.68	.000	.8	4.5
2569	Oct. 14	(*)	36	.0	112	.000	.268	1.04	.000	.6	4.6
2599	Oct. 21	(*)	36	.22	131	.008	.100	1.32	.000	.8	4.5
2643	Oct. 28	(*)	1	3.05	150	.012	.292	3.16	.000	.5	4.0
2689	Nov. 18	(*)	9	1.90	170	.100	.620	3.80	.000	.5	4.0
2725	Nov. 25	(*)	7	1.47	156	.060	.252	2.36	.000	.8	4.5
2864	Dec. 31	(*)	36	.09	130	.008	.140	1.06	.000	.8	4.5
1890.											
2873	Jan. 7	(*)	36	.14	.....	.012	.124	.82	Trace	.8	4.5
2897	Jan. 28	(*)	36	.06	146	.048	.172	1.30	.000	.6	4.5
2950	Feb. 4	(*)	15	1.15	106	.020	.152	1.60	.000	.6	4.5
2956	Feb. 11	(*)	3	1.46	102	.392	.640	3.66	Trace	.8	5.0
2967	Feb. 12	(*)	9	1.46	94	.208	.260	1.80	Trace	.8	.....
2972	Feb. 17	(*)	1	.73	274	.108	.652	3.96	Trace	.8	4.5
2982	Feb. 24	(*)	3	.56	212	.020	.388	1.10	Trace	.8	4.5
2996	Mar. 11	(*)	36	.10	.....	.008	.108	.82	Trace	.8	4.5
3006	Mar. 18	(*)	2	1.49	270	.012	.444	3.42	.000	Trace	4.0
3019	Mar. 25	(*)	1	1.32	.....	.100	.372	1.70	Trace	.8	4.5
3030	Apr. 1	(*)	14	.18	112	.140	.352	1.62	Trace	.6	4.0
3057	Apr. 14	20	17	.46	122	.048	.440	1.58	.000	.8	4.0
3078	Apr. 22	36	36	.54	80	.020	.302	1.30	.000	.8	4.0
3090	Apr. 29	36	5	.102	94	.004	.260	1.12	.000	.0	4.5
3122	May 13	36	29	.73	.....	.020	.400	1.95	.000	.8	4.0
3140	May 20	36	2	.40	.....	.008	.254	1.70	.000	.8	4.5
3153	May 27	6	1	1.63	84	.008	.300	2.10	.000	.6	4.0
3205	June 17	25	3	.48	106	.006	.142	.98	.000	.6	4.0
3234	July 2	17	9	.18	.....	.000	.212	1.84	.000	.8	4.0
3257	July 15	36	36	.00	.....	.024	.228	1.56	.000	.4	4.0
3326	Aug. 5	36	22	.64	.....	.012	.200	1.18	.000	.5	4.0
3355	Aug. 19	12	23	1.21	150	.000	.420	2.02	.000	.6	4.0
3399	Sept. 2	12	6	.01	148	.008	.280	1.92	.000	.8	4.5
3417	Sept. 9	24	20	.20	120	.012	.220	1.60	.000	.0	4.5
3458	Sept. 23	11	12	.06	132	Tr.	.440	1.98	.000	.6	4.5
3472	Sept. 30	28	34	.38	110	.001	.060	2.10	.000	.8	4.5

* Not in use.

The extremes for each determination are:

	Highest.	Date.	Lowest.	Date.
Solid.....	274.	February 17, 1890.....	80.	April 22, 1890.
Free ammonia.....	.392	February 11, 1890.....	.000	Several occasions.
Albuminoid ammonia.....	.652	February 17, 1890.....	.060	September 30, 1890.
Oxygen consumed.....	3.96	do.....	.82	January 7, March 11, 1890.
Nitrogen as—				
Nitrites.....	Trace.	Eight occasions.....	.000	Generally.
Nitrates.....	.8	Nineteen occasions.....	.4	July 15, 1890.
Chlorine.....	5.0	September 30, 1889, February 11, 1890.	4.0	Thirteen occasions.

The water was in its worst condition February 17, and in its best in the middle of June. At the former date it was flowing directly from the river into the mains, as it was during the whole period from October 4, 1889, to March 18, 1890, during the laying of the 48-inch main. The evidence of the analyses is to the effect that the aqueduct water carries frequently large amounts of vegetable organic matter in suspension and solution, and that greater opportunity for subsidence is demanded as a remedy. The plan of Captain Symons for the utilization of the upper reservoir after proper disposition of the drainage from its surrounding watershed would no doubt largely remedy this evil. Any system of filtration would probably be unavailable, owing to the fact that no loss of head can be allowed and because the expense would be extremely large.

Some experiments, carried on in this office in February when the aqueduct water was in its worst condition, by Mr. E. Devonshire, illustrative of the Anderson process of purification, gave results which are of interest, and although this method of treatment probably could not be used practically on account of loss of head the analyses show how far purification of the water is possible.

Results with the Anderson process.

	Condition.	Solids.	Volatile.	Free ammonia.	Albuminoid ammonia.	Oxygen consumed at 100° Centigrade.	Nitrogen as—		Chlorine.
							Nitrites.	Nitrates.	
February 11, 1890:									
Aqueduct.....	Muddy, 1.	102	36	.392	.640	3.66	Trace	.8	5.0
Iron and air.....	Bright, 36.	66	36	1.692	.560	3.24	.008	.35	.....
February 12, 1890:									
Aqueduct.....	Turbid, 9.	94	36	.208	.260	1.70	Trace	.8	4.5
Iron and air.....	Bright, 36.	72	26	1.012	.228	.80	.009	.8	.....
February 17, 1890:									
Aqueduct.....	Turbid, 1.	274	50	.108	.652	3.96	Trace	.8	4.5
Iron and air.....	Bright, 36.	84	42	.880	.400	.98	.010	.2	.....
Iron alone.....	do.....	92	42	.800	.188	.98	.025	.8	.....

The latter analyses, in which the process was working at its best, show what a great improvement has been brought about as evidenced by the great reduction in albuminoid ammonia and oxygen consumed in parts per million. In all the experiments the muddy water became bright and sparkling. The process consists of passing the water either alone or mixed with air through a revolving cylinder containing waste scrap iron with a duration of contact in practical works of not more than three and a half minutes, the iron by proper mechanical devices being showered down through the water. On issuing from the purifier or cylinder, where air has not been introduced, the water is aerated to change the soluble ferrous salt to ferric by flowing along an open channel of moderate length and then onto a shallow sand filter where the precipitated oxide inclosing the mechanical impurities is strained out. No iron remains after filtration. An experimental plant has recently been erected in Philadelphia.

CONTAMINATION OF THE POTOMAC AND EASTERN BRANCH BY SEWAGE.

At the request of the sewage commission an examination of the waters of the Potomac and Eastern Branch was undertaken at different states of the tide to determine the

amount of pollution from sewage. The samples were collected in a way to illustrate the average condition of the mass of water in the streams, being taken in small portions in a line across the streams, and from 1 to 2 feet below the surface, according to well known methods. The results were as follows:

Water in the Eastern Branch at Buzzard Point.

2757. December 2, 1889, 9.30 a. m.; low water at 9.35 a. m. 2777. December 9, 1889, 2.50 p. m.; low water at 3.15 p. m. 2861. December 31, 1889, 9.10 a. m.; low water at 9.18 a. m.]

Serial No.	Condition.	Color.	Total solid.	Organic and volatile.	Nonvolatile.	Free ammonia.			Nitrogen as free ammonia.	Albuminoid ammonia.			Nitrogen as albuminoid ammonia.	Oxygen consumed.	Nitrogen as nitrites.	Nitrogen as nitrates.	Chlorine.
						First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.		First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.					
2757	Turbid.....	.0	128	58	70	.500	.000	.500	.412	.360	.000	.360	.296	1.92	Tr.	.5	4.5
2777	Slightly turbid.	.5	114	44	70	.540	.100	.660	.544	.232	.000	.232	.211	1.44	.005	.8	4.5
2861	....do.....	.0	132	53	79	.360	.060	.420	.346	.152	.000	.152	.125	1.30	.005	.6	4.5

Water in the Eastern Branch, between First and Second streets, east.

[2759. December 1, 1889, 2.30 p. m.; high water, 3.05 p. m. 2779. December 10, 1889, 8.45 a. m.; high water, 9.44 a. m. 2860. December 30, 1889, 1.45 p. m.; high water, 2.32 p. m.]

Serial No.	Condition.	Color.	Total solid.	Organic and volatile.	Nonvolatile.	Free ammonia.			Nitrogen as free ammonia.	Albuminoid ammonia.			Nitrogen as albuminoid ammonia.	Oxygen consumed.	Nitrogen as nitrites.	Nitrogen as nitrates.	Chlorine.
						First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.		First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.					
2759	Turbid.....	.0	144	68	76	.220	.000	.220	.181	.208	.000	.208	.171	3.38	Tr.	.5	4.5
2779	Clear .....	.5	126	38	88	.160	.020	.180	.147	.140	.012	.152	.125	1.06	Tr.	.6	4.5
2860	Slightly turbid.	.0	144	60	84	.300	.000	.300	.247	.172	.032	.204	.168	1.26	Tr.	.5	4.5

Water in Georgetown Channel between buoys 4 and 6.

2758. December 1, 1889, 1.55 p. m.; high water, 3.05 p. m.; 2778. December 9, 1889, 1.45 p. m.; low water 3.13 p. m.; 2862. December 30, 1889, 1.15 p. m.; high water, 2.32 p. m.]

Serial No.	Condition.	Color.	Total solids.	Organic and volatile.	Non-volatile.	Free ammonia.			Nitrogen as free ammonia.	Albuminoid ammonia.			Nitrogen as albuminoid ammonia.	Oxygen consumed.	Nitrogen as nitrites.	Nitrogen as nitrates.	Chlorine.
						First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.		First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.					
2758	Turbid.....	.0	126	60	66	.008	.000	.008	.007	.140	.000	.140	.115	1.46	.000	.5	4.5
2778	Slightly turbid.	.3	132	42	90	.008	.000	.008	.007	.112	.000	.112	.092	.90	Tr.	.8	4.5
2860	Clear.....	.0	144	76	68	.048	.000	.048	.039	.180	.000	.180	.148	1.28	Tr.	.8	4.5

Water from Potomac at Great Falls drawn through laboratory tap.

[2760, December 2, 1889, a. m.; 2780, December 9, 1889, a. m.; 2864, December 31, 1889, a. m.]

Serial No.	Condition.	Color.	Total solids.	Organic and volatile.	Non-volatile.	Free ammonia.			Nitrogen as free ammonia.	Albuminoid ammonia.			Nitrogen as albuminoid ammonia.	Oxygen consumed.	Nitrogen as nitrites.	Nitrogen as nitrates.	Chlorine.
						First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.		First 50 cubic centimeters.	Second 50 cubic centimeters.	Total.					
2760	Turbid.....	.0	120	54	66	.008	.000	.008	.007	.232	.000	.232	.191	1.78	.000	.6	4.3
2780	Turbid.....	.3	104	40	64	.000	.000	.000	.000	.232	.012	.244	.201	1.70	.000	.8	4.0
2864	Turbid.....	.0	130	52	78	.008	.000	.008	.007	.140	.000	.140	.115	1.06	.000	.8	4.3

The conclusions which the Commission have drawn from these interesting figures will be found in their report. I will only point out that from a chemical point of view alone the water in the Georgetown channel is cleaner after the aëration of passing over the falls and settling at tidewater than it is above the Great Falls. A few samples of sewage, taken from the different main sewers during different degrees of precipitation, were reported upon.

Analyses of sewage.

Locality.	Date.	Precipitation.	Condition.	Total solids.	Organic and volatile.	Ammonia.		Nitrogen as—		Oxygen consumed.	Chlorine.
						Free.	Albuminoid.	Nitrites.	Nitrates.		
Seventeenth street.	Apr. 27	Heavy	Turbid..	248	92	1.448	2.840	.000	5.0	22.0	13.8
James Creek	Apr. 27	..do...	Very turbid.	328	88	1.448	2.240	.000	3.0	22.0	14.5
Seventeenth street.	June 11	Dry...	Very dirty.	1,096	450	43.000	8.300	.000	1.5	53.0	46.0
Sixth street	June 24	..do...	..do...	226	76	37.400	5.200	.000	0.0	36.0	30.0
Seventeenth street.	June 24	..do...	..do...	248	148	14.000	3.000	.000	0.0	36.0	36.0
Tiber .....	.....	..do...	..do...	.....	.....	26.600	3.000	.000	0.0	30.0	46.0

HYDRAULIC CEMENTS.

The completion of increased and more convenient storage facilities for cement and the questionable character of some of the deliveries under contracts have brought about a very large increase in the amount of testing during the past year. The result has been the rejection of numerous lots, and an improvement in the standard of the material in use upon the works. Incidentally there has been brought about the education of manufacturers and dealers to a better appreciation of the possibilities and necessities of the quality of cements in use in the District. I believe that in another year it will be desirable to increase the standards of the specifications for both natural and Portland cements.

NATURAL CEMENTS.

The following brands of natural cement have been tested during the past year and are the most prominent of those in use in the District. Some very inferior brands never reach this office.

Brand.	Lots inspected.	Samples.
erland.....	187	1,381
l Top.....	49	915
lam.....	24	589
erdstown.....	13	13
an.....	5	43
Lock.....	4	41
ied.....	3	22
York and Bridge.....	2	2
m River.....	1	1
ent.....	1	1
ing.....	2	2
Total.....	241	3,010

e character of these various brands is best illustrated by typical results of tests
h I have selected from the very many on record.

ROUND TOP.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
		Per cent.	Per cent.			Per cent.	° F.
80.....	Nov. 9, 1889	.5	11.5	22	.....	35.0	68
15.....	July 29, 1890	6.5	.....	25	.....	36.0	78
57.....	Aug. 20, 1890	5.5	19.5	11	.....	32.0	78
10.....	Sept. 5, 1890	2.5	.....	21	.....	36.0	82

Tensile strength.

	Neat.												Two parts sand.								
	1 day.			7 days.			28 days.			3 months.			7 days.			28 days.			3 months.		
80...	72	74	70	189	176	189	280	268	218	332	300	278	86	86	38	86	86	84	220	170	178
15...	60	66	66	242	240	240	328	334	326	.....	.....	.....	110	112	110	186	184	184	.....	.....	.....
57...	50	52	50	238	256	254	306	328	280	.....	.....	.....	110	94	84	260	262	258	.....	.....	.....
10...	70	76	70	236	238	234	256	274	307	.....	.....	.....	120	122	122	196	210	218	.....	.....	.....

ROUND TOP.

	Date delivered for in- spection.	Residue on sieve.		Set (wire test).		Water.		
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temper- ature.	
		<i>Per cent.</i>	<i>Per cent.</i>			<i>Per cent.</i>	° F.	
1 to 25.....	Sept. 4	2.5	.....	20	33	26	36.0	78
26 to 50.....	Sept. 4	2.5	.....	20	28	24	36.0	78
51 to 57.....	Sept. 5	2.6	.....	20	28	24	36.0	79

Tensile strength.

	Neat.									Two parts sand.					
	1 day.			7 days.			28 days.			7 days.			28 days.		
1 to 25	50	50	52	248	246	252	290	298	296	104	106	104	242	236	238
26 to 50	50	52	52	202	236	208	254	254	192	126	124	122	182	202	184
51 to 57	50	48	50	194	224	186	226	260	272	130	128	131	212	214	214

CUMBERLAND.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
		Per cent.	Per cent.			Per cent.	°F.
Lot 2825	Dec. 17, 1889	6.0	21.5	14	28	35.0	
Lot 2847	Dec. 23, 1889	5.8	21.8	19	38	35.0	
Lot 3025	Mar. 31, 1890	2	9.5	29		34.1	
Lot 3036	Apr. 3, 1890	3.5	14.5	24		33.1	

Tensile strength.—Neat.

	1 day.	7 days.	28 days.	3 months.	6 months.
Lot 2825	76 74 76	188 222 142	386 324 328		
Lot 2847	78 70 72	198 200 194	376 362 268	372 370 376	380 378 37
Lot 3025	76 80 120	300 356 300	306 364 386		
Lot 3036	126 136 142	340 332 336	386 384 380		

Tensile strength.—Two parts sand.

	7 days.	28 days.	3 months.	6 months.
Lot 2825	18 18 18	64 60 60		
Lot 2847	16 17 16	54 57 56	230 228 234	298 296 29
Lot 3025	68 68 70	200 198 200		
Lot 3036	76 82 84	220 224 222		

ANTIETAM.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
		Per cent.	Per cent.		Hr. M.	Per cent.	°F.
Lot 2639	Nov. 4, 1889	3.8	14.5		1 39	30.0	
Lot 3026	Mar. 31, 1890	.8	7.0	17 27 22		32.1	
Lot 3031	Apr. 2, 1890	2.8	15.5	27	49	30.0	

Tensile strength.

	Neat.				Two parts sand.		
	1 day.	7 days.	28 days.	3 months.	7 days.	28 days.	3 months.
Lot 2639	40 38 40 44 44 40	196 196 196			10 7 12 60 48 58		
Lot 3026	52 50 52 102 98 96	213 210 216			24 24 26 109 98 100		
Lot 3031	66 72 50 111 111 108	198 210 206 356 348 360			42 48 46 108 108 110 196 188		

SHEPHERDSTOWN.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
		<i>Per cent.</i>	<i>Per cent.</i>		<i>Hr. M.</i>	<i>Per cent.</i>	<i>° F.</i>
Lot 2850	Oct. 30, 1889	4.5	13.5	17	1 20	34.0	70
Lot 3076	Apr. 22, 1890	2.8	6.5	40		34.1	68
Lot 3439	Oct. 24, 1890	1.5		28		32.0	70

	Tensile strength—Neat.														
	1 day.			7 days.			28 days.			3 months.			6 months.		
Lot 2850	24	30	32	64	54	52	222	224	220	280	344	378	398	394	390
Lot 3076	68	82	58	146	146	148	292	296	294						
Lot 3439	60	60	60	134	134	122									

	Tensile strength—Two parts sand.											
	7 days.			28 days.			3 months.			6 months.		
Lot 2850	12	14	25	42	46	46	142	172	170	226	224	224
Lot 3076	82	80	82	170	178	178						
Lot 3439	41	41	40									

ROSENDALE.

Brand.	Lot.	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
			50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
			<i>Per cent.</i>	<i>Per cent.</i>	<i>Hr. M.</i>	<i>Hr. M.</i>	<i>Percent.</i>	<i>° F.</i>
Hoffmann	2617	Oct. 23, 1889			{ 1 48	1 25	30.0	66
Hudson River	2573	Oct. 15, 1889	25	10	2 16	3 40	30.0	64
New York and Bridge	2754	Nov. 29, 1889	5	11.5	2 22	5	33.0	68
New York	2716	Nov. 21, 1889	9.5	19.5	1 25		34.0	70

Brand.	Lot.	Tensile strength—Neat.														
		1 day.			7 days.			28 days.			3 months.			6 months.		
Hoffmann.....	2617	86	86	98	98	96	230	206	212		410	454	476	434	436	434
Hudson River.....	2573	38	40	60	60	58	176	174	176					364	369	374
New York and Bridge.....	2754	44	44	62	60	68										
New York.....	2716	38	36	40	50	56	56	126	136	128				420	366	388

Brand.	Lot.	Tensile strength—Two parts sand.											
		7 days.			28 days.			3 months.			6 months.		
Hoffman	2617	12	12	12	58	57	50	206	196	204	204	202	206
Hudson River	2573		10	10	42	46	42				202	192	200
New York and Bridge	2754	16	12	9	84	84							
New York	2716	6	0	0	32	30	30				110	110	112

ROSENDALE—Continued.

Brand.	Lot.	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
			50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
			Per cent.	Per cent.			Per cent.	°F.
Shield Siegfried	2715	Nov. 18, 1889	2.4	17.5	28	.....	32.0	64
Crescent	3214	July 30, 1890	10.5	22.5	12	40	32.1	78

Brand.	Lot.	Tensile strength—Neat.														
		1 day.			7 days.			28 days.			3 months.			6 months.		
Shield Siegfried	2715	13	12	54	54	54	132	134	128	132	130	136	234	230	236	
Shield Rock Lock										132	130	136	234	230	236	
Crescent	3214	32	30	30	150	156	156	258	262	260	.....	.....	.....	.....	.....

Brand.	Lot.	Tensile strength—Two parts sand.									
		7 days.			28 days.			3 months.		6 months.	
Shield Siegfried	2715	12	12	12	32	28	34	58	62	57	80 78 80
Shield Rock Lock								58	62	57	80 78 80
Crescent	3214	26	26	26	86	86	88	.....	.....	.....	.....

The Round Top cement has proved itself extremely even in character and a most desirable cement. Cumberland is almost equally as good when the setting qualities are properly regulated and the grinding properly conducted. In the two latter respects considerable trouble was experienced during the past year.

The Antietam and Shepherdtown cements are quite different in character from the preceding. They contain considerable magnesia, which, unless carefully burned, has a tendency to diminish *initial strength* and to produce a slow set. When properly burned these are excellent cements and in almost all cases are quite satisfactory where *initial strength* is not an important consideration, as at six months or one year they generally equal the lime cements in tensile strength.

The remaining brands do not reach the standard required by the District specifications. Many of them attain an eventual strength sufficient to permit their use where *initial strength* is not an object.

It must be added that I am in most cases not responsible for the representative nature of the samples as they have not been drawn in person, but I am convinced that they represent the brands named, at least as sold in the District.

PORTLAND CEMENTS.

During the past year there has been some increase in the number and character of the Portland cements upon the market. The manufacture of cement tiles and contracts for laying cement sidewalks have been the means of bringing to my attention the following brands:

Brand.	Lot.	Samples.	Brand.	Lot.	Samples.
Hanover	11	138	German Imperial	1	1
Hoxter	2	2	German Eagle	1	1
Hyne	2	21	German Elk	1	1
Dyckerhof	2	20	Black Cross	1	1
Knight, Bevans & Sturge	3	3	Burham	1	1
Brooks & Shoebridge	2	2	Belgian	1	1
Stettin Anchor	2	2	Shifferdecker	1	1
Manheller	1	1			
Elephant	1	1	Total	34	198
London Imperial	1	1			

The character of these brands is shown by the following tests: Hanover has been supplied under the contract for 1889-'90, and Hoxter will be under the present contracts. The other brands have been either used or proposed in tiles and sidewalks.

HANOVER.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>H. m.</i>	<i>H. m.</i>	<i>Per cent.</i>	<i>° F.</i>
Lot 3022.....	Mar. 27, 1890	Trace.	2.5	3 18	.....	24	72
Lot 3073.....	Apr. 22, 1890	.5	2.5	1 43	.....	25	68
Lot 3092.....	May 1, 1890	.5	3.5	2 12	.....	24.6	74
Lot 3161.....	June 2, 1890	2.0	.....	35	.....	24	80
Lot 3189.....	June 11, 1890	2.0	.....	1 14	.....	24	76

Tensile strength.									
Neat.					Three parts sand.				
1 day.		7 days.		28 days.	7 days.		28 days.		
Lot 3022.....	284	694	710	650	798	850	796	170	169 160 282 288 280
Lot 3073.....	140 143 140	446	452	450	530	490	482	126	122 124 178 170 176
Lot 3092.....	144	570	566	570	702	688	686	128	134 136 212 216 210
Lot 3161.....	146	426	590	508	592	586	598	124	118 126 192 188 194
Lot 3189.....	180 208	390	396	410	552	576	578	126	120 124 144 140 148

STETTIN ANCHOR.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).		Water.	
		50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>H. m.</i>	<i>H. m.</i>	<i>Per cent.</i>	<i>° F.</i>
Lot 3253.....	July 14, 1890	Trace.	2	1 35	.....	23.5	78
Lot 3479.....	Oct. 1, 1890	Trace.	9.5	1 38	.....	24.1	70

Tensile strength.									
Neat.					Three parts sand.				
1 day.		7 days.		28 days.	7 days.		28 days.		
Lot 3253.....	306 310 280	538	532	546	700	750	688	126	118 120 238 230 236
Lot 3479.....	286 280 284	490	498	519	.....	126	120	.....	.....

DYCKERHOF.

Lot.....	2,580
Date delivered for inspection.....	Oct. 18, 1889
Residue on sieve:	
50-mesh.....	per cent.. 3.2
100-mesh.....	do.. 6.2
Set (wire test):	
Initial.....	3 h. 10 m.
Hard.....	5 h. 45 m.
Tensile strength:	
One-day neat.....	264, 264
Seven days neat.....	638, 640, 636
Twenty-eight days neat.....	520, 536, 541
Three months neat.....	756, 774, 776
Six months neat.....	722, 722, 726
Seven days, three parts sand.....	110, 112, 110
Twenty-eight days, three parts sand.....	160, 168, 160
Three months, three parts sand.....	184, 186, 188
Six months, three parts sand.....	259, 252, 249
Water:	
In mortar.....	per cent.. 22
Temperature.....	degrees Fahr.. 62

KNIGHT, BEVANS, AND STURGE.

	Date delivered for inspection.	Residue on sieve.		Set (wire test).			Water.	
		50-mesh.	100-mesh.	Initial.	Hard.		In mortar.	Temperature.
Lot 2550	Oct. 11, 1889	<i>Per cent.</i>	<i>Per cent.</i>	<i>M.</i>	<i>H.</i>	<i>m.</i>	<i>Per cent.</i>	<i>° F.</i>
Lot 3476	Sept. 30, 1890	6.5	18.5	35	*5	0	22	
		4.5	25.5	28	1	22	20	

		Tensile strength.							
		Neat.				Three parts sand.			
		1 day.	7 days.	28 days.	3 months.	7 days.	28 days.	3 months.	
Lot 2550	†134		336 328	440 448 442	670 676	60 56 56	84 86 86	130 130	
Lot 3476	160 162	368 378 372				66 68 66			

* Over.

† Under damp cloth.

VARIOUS BRANDS PORTLAND.

Brand.	Lot.	Date delivered for inspection.	Residue on sieve.		Set (wire test).			Water.	
			50-mesh.	100-mesh.	Initial.	Hard.		In mortar.	Temperature.
			<i>Per cent.</i>	<i>Per cent.</i>	<i>Hr.</i>	<i>M.</i>	<i>Hr.</i>	<i>M.</i>	<i>Per cent.</i>
Mannheim	3236	July 3, 1890	.5	9.0	2	40	4	39	23.0
Belgian	3246	July 11, 1890	1.7	19.8	1	38			24.0
Burham	3247	July 11, 1890	1.6	22.0	1	7			23.4
Hoxter	3249	July 12, 1890	1.2	4.5	2	40			25.2

Brand.	Lot.	Tensile strength.							
		Neat.				Three parts sand.			
		1 day.	7 days.	28 days.	3 months.	7 days.	28 days.	3 months.	
Mannheim	3236		328 536 532 538	576 574 578	590 638 650	116 117 112	146 136 138	182 206 21	
Belgian	3246		250 254 254 270	(*)		20 22 24 28 30 36			
Burham	3247	250 262 268 354 380 402 490 496 492				56 58 60 92 98 100			
Hoxter	3249	262 262 266 326 322 328 420 416 422				100 114 98 137 142 146			

* Disintegrated.

Brand.	Lot.	Date delivered for inspection.	Residue on sieve.		Set (wire test).			Water.	
			50-mesh.	100-mesh.	Initial.	Hard.		In mortar.	Temperature.
			<i>Per cent.</i>	<i>Per cent.</i>	<i>Hr.</i>	<i>M.</i>		<i>Per cent.</i>	<i>° F.</i>
London Imperial ..	2720	Nov. 22, 1889			4	13	28	24.0	
German Eagle	2745	Nov. 27, 1889	1.1	10.5	4	41		24.0	
German Imperial ..	2746	Nov. 27, 1889	.5	6.0	4	30		26.0	
German Elk	2747	Nov. 27, 1889	.1	40	4	22		26.5	

VARIOUS BRANDS PORTLAND—Continued.

Board.	Lot.	Tensile strength.									
		Neat.						Three parts sand.			
		1 day.		7 days.		28 days.		7 days.		28 days.	
London Imperial .	2720	140		450 470		610 610		82 80		108 107	110
German Eagle . . .	2745	154	156	395	409	419	606	610	589	84	86 86
German Imperial . .	2746	110	113	300	310	320	450	436	454	86	88 89
German Elk	2747	172	169	396	394	390	396	393	398	110	102 106

Brand.	Lot.	Date delivered for inspection.	Residue on sieve.		Set, (wire-test.)		Water.	
			50-mesh.	100-mesh.	Initial.	Hard.	In mortar.	Temperature.
			Per cent.	Per cent.	Hr. M.	Hr. M.	Per cent.	F. °
Wyne Bros	3043	Apr. 7, 1890	1.	11	4 15	-----	24.0	68
Shifferdecker	3477	Sept. 30, 1890	Trace.	6.9	2 28	-----	22.4	68

Brand.	Lot.	Tensile strength.									
		Neat.						Three parts sand.			
		1 day.		7 days.		28 days.		7 days.		28 days.	
Wyne Bros	3043	400 470		546 547 540		644 640 636		132 132		206 204	220
Shifferdecker	3477	202	204 200	398	432 430	-----	-----	136 130	138	-----	-----

METHOD OF TESTING.

In testing cements the recommendations of the committee of the American Society of Civil Engineers have been followed, but in some respects they are not sufficiently definite, especially as to the manner in which the slow-setting Portland should be kept while setting, how soon they should be immersed for a twenty-four hour test, and in a like way how sand briquettes should be protected and handled.

Unsatisfactory results have been in several cases attributed by dealers or contractors to the fact that favorable conditions were not complied with in testing. In view of this fact experiments have been undertaken to analyze the conditions and their results. With some slow-setting Portland it is found that if they are allowed to set in the mold with one surface exposed to the air, the set is unequal in the exposed and unexposed portions of the briquettes, and to avoid this it is necessary as soon as initial set has taken place to raise the mold from the table, place upon edge, and cover it with a slightly damp cloth. When hard set by heavy wire test they may be immersed in water, but many cements will blow even then, when if kept in moist air for twenty-four hours before immersion they will not.

The best brand, however, will bear handling and immersion in the ordinary way, and as this way corresponds more nearly to that occurring in the practical use of the cement there seems to be no reason why it should not be followed. At least cements which will not stand this test, while they may be entirely suitable for surface work where there is no immersion and where they are covered for some time after use, are not at all fitted for sewer work where they may feel the action of water soon after use. It has been the custom, however, to test a doubtful cement in both ways

With natural cements the results have been found to vary somewhat at twenty-four hours with sand briquettes depending upon the manner in which they are handled as shown by the following results:

	Cumberland.	Antietam.
Taken out of mold as soon as made and covered at once with damp cloth.....	30 36 43	22 22 24
Covered at initial set with damp cloth.....	52 56 56	30 30 38
Covered at hard set.....	66 66 72	30 30 32
Covered at very hard set.....	76 74 70	28 36 30
Left in mold and covered at once.....	72 68 76	24 26 28
Taken from mold when hard set and covered.....	78 68 74	30 30 24
Not covered at all.....		28 30 32

Antietam is not affected at all, being a slow magnesian cement, but it is plain that cements of the Cumberland class should not be covered until hard set, and this rule has been followed.

In all cases, to obtain uniform results, it has been found advisable to stand briquettes upon edge while under cover so that they may be uniformly exposed to the air.

SPECIFICATIONS.

The specifications for natural and Portland cements for the year 1890, 1891 are as follows:

SPECIFICATIONS FOR CEMENT.

All tests shall be made by the methods and under the conditions prescribed by the committee of the American Society of Civil Engineers and shall be open to contractors.

NATURAL CEMENT.

[To be delivered in new, strong barrels, to weigh 300 pounds net.]

- (1) *Fineness*—Not less than 92 per cent. to pass through a 50-mesh sieve.
 (2) *Time of setting*—Initial set in not less than 10 nor more than 45 minutes, when mixed with the smallest possible amount of water between the temperatures of 60° and 70° F.
- | | |
|--|------------------------|
| | Pounds. |
| (3) <i>Tensile strength</i> —1 day (in air till hard set, rest of day in water). | Neat..... 30 |
| 7 days (in air one day, in water 6 days). | Neat..... 70 |
| | Two parts sand..... 20 |
| 28 days (in air 1 day, in water 27 days). | Neat..... 173 |
| | Two parts sand..... 60 |

PORTLAND CEMENT.

[Barrels to weigh 400 pounds gross, average.]

- (1) *Fineness*—Not less than 95 per cent. to pass through a 50-mesh sieve, and not less than 85 per cent. to pass through a 100-mesh sieve.
 (2) *Time of setting*—Initial set in not less than one hour, when mixed with water under the same conditions as with natural cement, except where quick cement is desired, which should set in less than 10 minutes.

	Pounds.
(3) <i>Tensile strength</i> —1 day (in air till hard set, in water rest of day).	Neat..... 125
7 days (in air 1 day, in water 6 days).	Neat..... 300
	Three parts sand..... 100
28 days (in air 1 day, in water 27 days).	Neat..... 400
	Three parts sand..... 125

All cements will be from time to time subjected to chemical analysis, and must show freedom from any foreign substances or deleterious matter, and that the elements are combined in proper proportion to secure the best results and insure permanency.

For another year, in view of what has been learned of the possibilities of the available brand of this market, I would suggest that the preceding specifications be made more strict. The following limits seem to me desirable:

SPECIFICATIONS RECOMMENDED FOR 1890-'91.

All tests shall be made by the methods and under the conditions prescribed by the Committee of the American Society of Civil Engineers and shall be open to contractors.

NATURAL CEMENT.

[To be delivered in new strong barrels to weigh 300 pounds net.]

1st. *Fineness*—Not less than 95 per cent. to pass through a 50-mesh, and 85 per cent. through a 100-mesh sieve.

2d. *Time of setting*—Initial set in not less than 10 nor more than 45 minutes, when mixed with the smallest possible amount of water between the temperatures of 60° and 70° F.

	Pounds.
3d. <i>Tensile strength</i> —1 day (in air till hard set, rest of day in water). Neat.....	50
7 days (in air 1 day, in water 6 days). Neat.....	150
Two parts sand.....	50
28 days (in air 1 day, in water 27 days). Neat.....	225
Two parts sand.....	100

PORTLAND CEMENT.

[Barrels to weigh 400 pounds gross, average.]

1st. *Fineness*—Not less than 98 per cent. to pass through a 50 mesh sieve, and not less than 95 per cent. to pass through a 100-mesh sieve.

2d. *Time of setting*—Initial set in not less than one hour, when mixed with water under the same conditions as with natural cement, except where quick cement is desired, which should set in less than 10 minutes.

	Pounds.
3d. <i>Tensile strength</i> —1 day (in air till hard set, in water rest of day). Neat.....	150
7 days (in air 1 day, in water 6 days). Neat.....	500
Three parts sand.....	100
28 days (in air 1 day, in water 27 days). Neat.....	600
Three parts sand.....	175

All cements will be from time to time subjected to chemical analysis, and must show proper proportions and combinations.

BOURNE CEMENT.

A cement has been brought to my attention for analysis and examination which is being introduced in the West under the above name and is in use for concrete in situations free from water, such as are common on the dry plains. Although this material would not be suitable for use here and has never been put upon this market, the results of my examination are of more than sufficient interest to make them worthy of record here.

Analyses of the crude clay from which the cement is burned, of the finished material, and tests of its properties have been made as follows:

	Clay.	Cement.
Water of combination.....	16.30	6.12
Carbonic acid CO ₂	5.36	4.18
Sulphuric acid SO ₃	30.79	34.46
Silica and insoluble silicates.....	12.85	16.82
Iron oxide Fe ₂ O ₃ , soluble in acids.....	.57	.79
Alumina Al ₂ O ₃ , soluble in acids.....	1.73	1.58
Lime CaO.....	30.01	32.89
Magnesia MgO.....	.66	.69
Undetermined, alkalies and loss.....	1.73	2.47
	100.00	100.00
Or as probably combined:		
Gypsum CaSO ₄ ·2H ₂ O.....	67.74	
Calcic sulphate (plaster) CaSO ₄		58.58
Calcic carbonate.....	12.19	9.50
Bases as silicates:		
Lime.....	1.61	3.08
Magnesia.....	.66	.69
Iron.....	.57	.79
Alumina soluble in acid.....	1.73	1.58
Alumina insoluble in acid.....	2.21	16.88
Silica.....	10.64	
Water of hydration, etc.....	2.13	6.12
	99.48	97.22
Or expressed more simply:		
Gypsum.....	67.74	
Carbonate of lime.....	12.19	9.50
Silica and silicates.....	17.42	21.74
Water.....	2.13	6.12
Free lime.....		1.28
Plaster.....		58.58
	99.48	97.22

Tensile strength with comparative results with plaster, etc.

			Bourne cement.						Plaster, in air.			Plaster and Cumberland, in air.			
			In air.			In water.									
Neat:															
1 day			128	132	138	136	130	138			294		170	170	170
7 days			298	313	312	136	140	138			350 346		290	320	320
28 days			284	274	276	120	118	118		410	410 408		304	398	410
3 months			314	310	310	98	98	98			350		386	390	390
Two parts sand:															
7 days			244	238	246	60	40	62		512	514 514		208	198	214
28 days			274	296	276	42	42	42			440 466		206	118	224
3 months			232	242	236	32	32	31			.....		242	236	240

This cement has plainly no hydraulic character and will not resist the action of water, but in situations where it is not exposed to such action it gives an extremely satisfactory result. In the dry regions of the West such conditions frequently exist. The cement will no doubt, from the low figure at which it is produced, compete successfully with hydraulic cements. Its great advantage lies in the immediate returns in tensile strength which it gives, which does not necessitate delays awaiting a hard set. It is a mixture of plaster, lime, and clay.

CONCRETE PAVEMENTS.

During the past year the improvement in materials and method of laying concrete pavements has been greater in the District than in many previous years. This improvement has related principally to a far better quality of crude asphalt as a starting point, greatly increased facilities for refining without injury to the material, and for the production of a uniform and regular cement.

CRUDE ASPHALT.

In my last report I described the character of the asphalt received during the summer of 1889, especially that of the cargo of the brig *Teneriffe*, which at my suggestion was condemned. The consignors of this cargo having appealed to your predecessor to have the condemnation removed, a careful study and investigation of this material was made and the Barber Asphalt Paving Company sent their chemist, Prof. H. C. Bowen of the Columbia School of Mines, to the island of Trinidad to investigate the deposits there, with special reference to this question, it being apparently a new one to all concerned in the industry.

The result of Professor Bowen's visit was an immediate change in the character of the material shipped to this port, and since that time all the crude asphalt received here has been of the most desirable description.

The difference in appearance between the asphalt of the *Teneriffe* cargo and that now received is so marked as scarcely to escape even the unpracticed eye.

The *Teneriffe* asphalt is crumbly, brittle, contains many lumps of soil and pieces of eoky matter, has a very brown color, especially when pulverized, and does not flow together into a solid mass, even under a hot July sun.

The asphalt as received at present is tough, can be bent slowly in summer without breaking, contains little soil, no coke, and has a richer blue-black color, retaining this color when pulverized, and very quickly flows together at all temperatures.

The opinion of all having any experience with crude asphalt, who were not personally prejudiced, was condemnatory of the appearance of the *Teneriffe* asphalt and the consignors only held that it could be so refined as to be equal to other asphalt. By direction of your predecessor they were allowed an opportunity to demonstrate this fact.

Under the direction of a Mr. Alexander experiments in refining the condemned asphalt were conducted in the small kettles of the Crawford Paving Company, and samples of the resulting products were collected by Capt. W. T. Rossell, who also selected specimens of the asphalt of more recent cargoes as refined in the old and worn out kettles of the Barber Asphalt Paving Company. All these specimens were then submitted to me for examination by number without further identification or information. As soon as they were pulverized and sampled they could be separated into two classes, one of which was of a blue-black color and soon united again into a more or less solid mass, while the other was very brownish-black in color and re-

mained loose and friable, the latter of course being the *Teneriffe* asphalt and the former that from the Barber Company's stills.

Further examination showed that there was a very decided difference in the physical characteristics of the samples corresponding to their appearance and some differences in their proximate composition.

Following are the results:

Number.	Consistency.	Color.	Softening point.	Flowing point.	Proximate composition.		
					Bitumen.	Non bituminous organic.	Mineral matter.
			°F.	°F.			
4	Viscous	Blue black	181	189	56.48	7.82	35.70
7	do	do	181	194	56.13	8.42	35.45
1	Less viscous	do	192	199	54.44	8.30	37.26
5	Friable	Brownish	230	248	52.95	7.51	39.54
6	do	do	237	255	52.27	7.92	39.81
2	do	do	232	245	51.22	9.18	39.60
3	Refuse	Dirty			25.10	4.30	70.60

Nothing was known as to the origin of the above samples during the progress of the analyses. They were grouped as above according to their apparent value. Afterwards they were identified to me as follows:

No. 4. Mixed cargoes, refined by the Barber Asphalt Paving Company, from arrivals in the autumn of 1889, of better quality, crude.

No. 7. Another sample of the same cargoes as No. 4.

No. 1. Cargo of the *Dunn*, refined by the Barber Asphalt Paving Company.

No. 5. Cargo of the *Teneriffe*, second run, refined by Mr. Alexander.

No. 6. Cargo of the *Teneriffe*, first run, refined by Mr. Alexander.

No. 2. Cargo of the *Teneriffe*, second run, refined by Mr. Alexander.

No. 3. Still bottoms from the Barber Asphalt Paving Company.

The results of the analyses arranged themselves properly according to the inferred character of the material.

The difference in the nature of the bitumen is such that there is a difference of 50° F. between the softening points of the two asphalts, necessitating the addition of several per cent. more residuum oil to produce from the *Teneriffe* a cement with the same penetration as that from the better asphalt, which seems to me to be undesirable. The proximate analyses show a larger per cent. of mineral matter in the *Teneriffe* asphalt; but this is hardly a serious matter, since it settles out in oiling to a great extent and becomes a waste product. If the analyses are calculated to a mineral free basis a better insight into the relation of the bituminous and nonbituminous organic matter is gained.

	No. 4.	No. 7.	No. 1.	No. 5.	No. 6.	No. 2.	No. 3.
Bitumen	87.84	86.96	86.77	87.58	86.84	84.86	85.37
Nonbituminous organic	12.16	13.04	13.23	12.42	13.16	15.20	14.63

The differences with the best refining is not large; with the worst, No. 2, serious. The differences in the physical nature of the bitumen is, however, the point indicative of inferiority and of the oxidation and changes to which it has been exposed. For comparison I give an analysis of so-called refined asphalt from Baltimore which in reality is merely the crude material from the inferior deposits melted to free it from water but not drawn off from the sediment:

Consistency	brittle
Color	brownish
Softening point, F	205°
Flowing point, F	251°

Proximate composition.

Bitumen	52.66	85.33
Nonbituminous organic	9.05	14.67
Inorganic, mineral matter	38.29	

Here the refining being at fault the relative proportion of organic matter not soluble in carbou bisulphide is not reduced, and the mineral matter is left at a high figure. The physical character of the bitumen also proves inferior. This material has been used in paving blocks.

The asphalt at present received is from the best deposits in the pitch lake in the island of Trinidad, as selected by Professor Bowen. As refined in the new horizontal stills of the Barber Company this crude material gives results far superior to those obtained with the samples analyses of which have been given, so that the difference between the best asphalts and the *Teneriffe* samples is still more marked than in the comparison selected. These stills are a vast improvement over the former crude method of refinery. They consist of horizontal cylindrical double-return flue boilers, so arranged with a system of fire-brick flues that the direct heat from the fire first reaches the sides of the stills, and then passing through the cylindrical boiler flues in the upper half of the still, finally returns underneath the bottom to the stack.

This arrangement prevents the caking and coking so prevalent in the old form of upright still, and does away with any overheating of the crude and refined asphalt. The result is a product, which, for general appearance and physical and chemical characteristics, is marked at once as being far ahead of anything hitherto produced here, and as producing a corresponding improvement in the quality of the cement. The stills refine from 50 to 60 tons of crude asphalt at a time in the neighborhood of one hundred hours, where, formerly, 10 tons were exposed to a prolonged and greater heat of from six to fourteen days, resulting in the loss of much oil and in hardening and coking of the asphalt. With a bank of four stills of this description the production of refined asphalt is large, in fact supplies large quantities for shipment, as well as the two paving companies in the District. The Cranford Company being almost entirely supplied with cement from these stills, the whole product of oiled asphalt is at once open to careful inspection, and it seems that no immediate improvement is possible in this feature of the work. It has certainly been the greatest advance in the industry in the District which has of late been brought about. The resulting product is found to show a softening point about 10° lower than that of the old stills, and is tenacious enough at medium temperatures (about 70° F.) to permit of pieces being slowly bent without fracture.

Analyses of several of the cargoes of lake asphalt received during the last six months gave the following results:

Ship.	Date.	No.	Water.	Inor- ganic matter.	Organic not bi- tumen.	Bitu- men.	Inor- ganic.	Organic not bi- tumen.	Bitu- men.
Boylston	April	3067	23.68	28.87	9.51	37.94	37.00	11.57	51.43
Geneva	May	3143	22.00	28.84	9.03	40.13	37.83	12.46	49.71
Glad Tidings	June	3186	27.21	27.34	7.93	37.52	37.56	10.89	51.55
Do	June	3196	22.35	30.25	8.23	39.17	38.96	10.59	50.45
Allon True	July	3243	26.72	27.28	7.64	38.36	37.23	10.43	52.34
Emery	August	3393	25.37	27.28	7.40	39.95	38.55	9.92	53.53
Frances	September ..	3483	27.82	26.65	7.20	38.33	36.92	9.97	53.11
Do	September ..	3492	25.90	27.84	8.36	37.00	37.59	11.28	51.13

The samples were from selected average lumps with the exception of Nos. 3143, 3196, and 3492, which were from averages produced by selecting a handful from each cartload discharged from the vessel's hold, and finally, after pulverizing, averaging a sample from this large lot. In this process some water was, of course, dried out, but the analyses calculated to dry material are comparable.

A peculiar characteristic of this improved quality of the crude asphalt is the viscous flow which it develops after removal from the vessel. The large heaps of fragments of the crude material, which are like chipped pieces of ice, slowly settle together and rapidly spread out like the glacial flow of ice, in every available direction, developing all the phenomena of glacial flow in the most striking manner. In another place I shall give some observations which I have made upon this interesting subject.

From the preceding analyses the following average composition of the lake asphalt received here of late is derived:

Water in crude	{ *25.13
Crude dry material:	{ †26.16
Bitumen	51.65
Nonbituminous organic matter	10.89
Mineral matter	37.46

* All samples.

† Excluding partially dried.

The lake asphalt is therefore in its crude state, not freer from nonbituminous organic matter than the overflow, the relation being 1 to 1.74 in the former and about the same in the latter, but derives its durable quality from the character of its bitumen in the refined asphalt, which, as has been said, is very much superior to that hitherto obtained, as shown by the following determinations:

	Bitumen.	Nonbitumen.	Mineral matter.	Softens.	Flows.
				°F.	°F.
Random sample, Emery.....	55.60	8.30	36.10	205	210
First drawing, still No. 2, Frances.....	55.68	8.04	36.28	180	190
Last drawing, still No. 2, Frances.....	55.56	8.82	35.62	175	185

The softening point is considerably lower than that of any previous products and the quality of the bitumen proportionately improved.

STILL BOTTOMS.

In the bottom of the still, after drawing off all the refined material, a residue is left which is a considerable percentage of the whole crude material. The greater this is the better the quality of the supernatant asphalt, since it consists of the sediment of the impurities of the crude asphalt. It frequently reaches 10 per cent. of the original weight of crude which, together with the water driven off, constitutes a large amount of loss in refining as much as one-third of the crude material. A random piece of this sediment, which is much like a mastic, gave the following results on analysis:

Bitumen.....	per cent..	25.10
Nonbituminous organic.....	do.....	4.30
Inorganic.....	do.....	70.60
The inorganic matter consisted of—		
Sand not passing 30-mesh sieve.....		.85
40.....		1.50
50.....		.56
60.....		1.09
70.....		1.10
80.....		.50
90.....		2.90
100.....		trace
Dust passing 100.....		83.50
		<hr/> 100.00

The mineral matter, even that which settles out from the crude asphalt in an extraordinarily fine state of subdivision, while that remaining in suspension and mixture is very ferruginous in nature and in part so impalpable as to pass the closest filters.

The dust passing 100 meshes had the following composition:

Insoluble in acid.....		95.09
Consisting of—		
Silica.....		88.55
Alumina and iron, trace.....		4.91
Soluble alumina.....		2.38
Iron.....		1.92
Lime.....		.54
		<hr/> 99.93

The mineral matter of Trinidad asphalt seems to be almost entirely a fine sand with a little clay. It is evidently not adventitious at the surface, but must have been thoroughly incorporated and brought up from great depths, with the bitumen, if one may judge from its constant amount and character, in all parts of the deposit, and from the minute state of division of the iron oxide, as if resulting from the oxidation of some ferruginous mineral.

In the earlier part of the refining process, large pools of the water contained in the crude material and liberated on its melting, collect on the surface. This water has proved of considerable interest from a chemical and geological point of view in its

relation to the origin of the bitumen. It has all the characteristics of a strong thermal water and contains over 2 per cent. of salts in solution. It is acid in reaction effervescing strongly with carbonates. It becomes oxidized on exposure to the air with deposition of iron, manganese, and silica. The distillate from the stills is strongly acid and the presence of free hydrochloric, free sulphuric, hydrosulphuric acid, and other sulphur compounds has been determined. A qualitative examination shows the following result:

Asphalt water contains:

Chlorides	much	Titanates	none
Sulphates	much	Sodium	much
Sulphites	some	Ammonia	much
Sulphides	some	Lime	much
Borates	some	Magnesia	much
Phosphates	some	Iron	some
Iodides	some	Alumina	some
Silica	some	Manganese	some
Arsenates	some	Potash	some
Bromides	traces	Silica	some
Carbonates	none	Barium	none
Fluorides	none	Strontium	none
Nitrites	none	Cæsium	none
Nitrates	none	Rubidium	none

The gases evolved from the still contain so much hydrosulphuric acid that white paint in the neighborhood is turned quite black, while there are undoubtedly other gases existing in the cavities of the crude material which will prove of interest. A close study of the crude material is still in progress and will furnish results of considerable practical and scientific importance.

The effect of this acid water can not be a desirable one upon the bitumen nor the presence of such a large proportion of salts which in one of the large stills must amount to about a quarter of a ton of common salt and sodium sulphate. I have suggested the propriety of drawing off as much of this water as possible and neutralizing the acidity of the remaining salts with carbonates during the refining process.

OILED ASPHALT OR ASPHALT CEMENT.

Formerly in oiling the refined asphalt a sufficient amount of residuum oils was emptied from barrels into the melted asphalt in the stills and then agitated. The lack of uniformity in the character of the oil in different barrels made the result very uncertain, and with no opportunity for properly testing the oil before its use, and no definite means of determining the consistency, the cements produced were extremely variable. At present each shipment of oil is pumped into storage tanks, where the entire lot is well mixed, and can be depended on as uniform. While transferring in this way from barrels to tanks, the character of the oil and the amount of water it contains can be determined. I have found that the flash point, flowing point, and character of the paraffines are the best indices of the nature and show how to handle the oil. The best oil flashes at about 350° to 400°, flows not above 60° nor below 32° Fahrenheit, and does not contain coarsely crystallizing paraffines when solid, but is rather of a vaseline nature. From these characteristics it is possible to determine very nearly how much of any mixed tanks of oil to use in a still to produce a required penetration. This is pumped in after the refined asphalt has been cooled to about 325° F., after which agitation with a blower takes place for ten or more hours.

In this way very regular cement can be produced, varying chiefly according to the nature of the oil used. Its character is tested by means of the penetration machine devised by Professor Bowen, which I described in a previous report. This machine consists of a lever about 17 inches long containing a sharp cambric needle at one end and loaded at that end with a weight of 100 grams. The lever is connected with a spindle and dial through a steel rod and waxed cord. By a clip the rod and lever are held at any point immovable. The cement is placed so that the needle just touches its surface and then, the clip being released for a second of time, as taken from a quarter-second clock, the amount of penetration is registered in degrees on the dial. One condition must be carefully observed, the temperature of the cement. Originally Professor Bowen selected 77° F. as a proper temperature and brought his cements to this degree by keeping them and his penetration machine in a room heated to that temperature. I have found it much simpler and of universal application to use a tank of water at the standard temperature in which the cements are immersed. Several penetrations can then be made in a room of ordinary temperature before any change in the sample takes place. This modification permits of the use of this machine to great advantage at the works in following the oiling of cement. One has been employed at the Barber Asphalt Paving Company's yard for six months with

great success, and is continually in use for determining the result of oiling asphalt. As an example the penetrations of a still of oiled asphalt as it was gradually used are given.

	Degrees.
Aug. 18, 1890. Final blowing	90
Aug. 19, 1890. To tanks	90
Aug. 19, 1890. Portion blown to storage	100
Aug. 19, 1890. Tank wagon to Cranford	93
Aug. 20, 1890. Tank wagon to Cranford	108
Aug. 20, 1890. Tank wagon to Cranford	103
Aug. 20, 1890. From storage	97
Aug. 21, 1890. In use Cranford	90
Aug. 22, 1890. In use Cranford	94

Ninety degrees as a close average at the works is here considered the proper penetration, except in the hottest summer weather, and the limits are set at 80° to 100°.

I feel so far satisfied with the practical working of this test that I recommend its introduction into the specifications another year. The results are comparable in the hands of very different classes of people and have been thoroughly checked in practice. The only variation where care is taken lies in the hardening of all cement with age and resulting lowering of the reading. As an illustration the present penetration of a cement a year old will serve.

Penetration July 19, 1889, 78°; October 13, 1890, 24°; after melting, 30°.

Even with this tendency to harden, which is probably greater with an oil like the Lima, used in July last, with much hard paraffine, penetrations of old samples of cement have been found to vary from 20° to 136°, showing what great variation occurred where the mixer's judgment alone was trusted to determine the consistency of cement.

Record of the penetration of every lot of asphalt cement in use are kept in this office. The determinations are too numerous for publication, but the standard has averaged about 90°.

To insure the same penetration in a still of cement during its use it must be constantly agitated or blown, standing for a few hours being the cause of a separation, amounting to a difference of as much as 20° between the top and bottom parts of the cement. Care has also been necessary in the handling of the cement while it is being blown to storage tanks after final agitation on oiling. All difficulties in this direction which were at first troublesome have been removed.

RESIDUUM OILS.

The oils which have been in use this year have been obtained from three sources, Lima, Scranton, and Baltimore, and have proved very variable in character even from the same source. It seems impossible to expect a uniform supply, and the only recourse is to handle the different oils as well as the interpretation of the analyses and examination allow. Here are some of the analyses and determinations of physical properties.

Lima oil, No. 2275, August 7, 1889.

[Specific gravity, 25.8° B. Flashes, 431°. Flows, 78°.]

	Per cent.	Remarks.
Distillate to—		
310° F .....	.5	Water and trace of oil.
500° F	1.6	Deep-colored oil.
600° F	21.6	Dark vaseline; no paraffine.
Above 600° F	65.7	Dark green; little paraffine.
Coke	10.0	

Lima oil No. 2398.

	Per cent.	Remarks.
Distillate to—		
400° F	3.31	Light oil; no crystals at 75° F.
508° F	13.82	Medium oil; some paraffine.
600° F	33.28	More paraffine; will flow at 75° F.
Above 600° F	40.03	Solid and crystalline at 80° F.
Coke	7.40	

Lima oil, 3287, July 16, 1890.

[Specific gravity, 23° B. Flashes, 400°. Flows, 86°.]

	Per cent.	Remarks.
Distillate to—		
400° F	3.2	Light straw oil.
500° F	10.5	Light straw vaseline solid at 60° F.
600° F	22.0	Darker vaseline solid at 65° F.
Above 600°	48.6	Cracks into light oils.
Coke	10.7	
Loss in cracking	5.0	Gas, etc.

Baltimore oil, Poole & Brooke, 3087, April, 1890.

[Specific gravity, 23° B. Flashes, 370°. Flows, 50°.]

	Per cent.	Remarks.
Distillate to—		
400° F	2.75	Thin brown oil; some water.
500° F	10.56	Thicker brown oil.
550°	12.60	Do.
600°	44.42	Flourescent vaseline flows 65°.
650°	2.52	Solid paraffine crystals.
Cracked products	9.21	
Coke	8.50	
Loss in cracking	9.64	Gas, etc.

Baltimore oil, No. 3148, Poole & Brooke.

[Specific gravity 21.7°. Flashes, 350°. Flows, 46°.]

	Per cent.	Remarks.
Distillate to—		
400°	5.3	Light straw oil.
500°	5.5	Deeper amber oil, clear.
550°	28.0	Deeper caramel oil, clear.
600°	46.0	Semi-solid paraffines and vaselines at 70°.
Coke	12.5	
Loss	2.7	

Scranton oil, 3330, Maloney Bros.

[Specific gravity, 21.5°. Flashes, 380°. Flows, 48°.]

	Per cent.	Remarks.
Distillate to—		
400° F	2.06	Brown oil.
500°	4.67	Brown oil, with coarse scale.
600°	8.62	Solid at 70°, with scale.

Cracks above.

These analyses were made by putting about 100 grams of the residuum in a small tabulated retort, with a thermometer just reaching to the oil surface but not touching. The retort was then buried in asbestos and heated extremely slowly by an alcohol lamp at the distance of 12 inches. The most regular results I obtain in this way. Professor Bowen places his retort in a copper cylinder, packs it with asbestos

ing a thermometer in the asbestos applies the heat directly to the copper. salts are quite different from mine, as the following figures show :

Lima oil, 3084.

[Specific gravity, 20.8° B. Flashes, 392°. Flows, 75°.]

Date to—	Richardson.*		Bowen.†	
	Per cent.	Remarks.	Per cent.	Remarks.
			.62	Soft black vaseline.
			8.16	Rather stiff black vaseline.
	6.5	Brown oil; some paraffine crystal; flows 60°.	13.05	Cement-like. Penet 300.
	16.2	Brown oil, much coarse paraffine; solid at 68°; flows 80°.	9.81	Cement-like. Penet 200.
600°	67.3		56.24	
	10.0		12.16	

* Good oil, but too much coarse paraffine.

† Too rich in vaseline; stiff at 60° F.

results of different observers are not at all comparable.

SURFACE MIXTURE.

the combination of the materials for surface mixture there has been no change the past year. The quality of the sand has been excellent, and the limestone one dust the same as in use for a long time.

plant for mixing at the works of the Cranford Company is comparatively new respects and in good working order; that of the Barber Company is old and in condition, so that, as great regularity in heating the sand is not obtained; it be replaced.

bles of the sand in use were of the following sizes :

Samples from the platform, after passing rotaries of sand and stone dust.

Residue on—	Cranford.	Barber.
30.....	18.9	20.7
40.....	38.7	28.6
50.....	13.3	13.6
60.....	19.7	19.7
70.....	3.3	3.3
80.....	.8	1.0
90.....	2.3	2.2
100.....	trace.	.0
Dust and loss.....	3.0	10.9

ground limestone has been furnished of different degrees of fineness.

Residue on—	Finer.	Coarser, Sept., 1890.
20.....	.0	.....
30.....	.0	1.3
40.....	tr	1.5
50.....	tr	2.5
60.....	.5	5.2
70.....	.5	6.2
80.....	tr	2.2
90.....	1.0	7.9
100.....	.3	2.0
Dust.....	97.7	71.2

finer dust must have a greater effect than the coarse sample.

The stone dust is of the following size in two average samples:

Residue on—	1888.	1889.
20 mesh sieve.....	32.3	39.6
30 mesh sieve.....	7.1	8.4
40 mesh sieve.....	9.5	4.7
50 mesh sieve.....	2.9	2.5
60 mesh sieve.....	9.5	4.1
70 mesh sieve.....	10.8	3.2
80 mesh sieve.....	1.6	1.1
90 mesh sieve.....	14.7	4.3
100 mesh sieve.....	0.0	2.2
Dust.....	11.6	29.9

A large portion of the coarsest residue is rejected on the sand rotary screens of 56 meshes to the square inch, in the process of heating and is carted away with the gravel. It would seem that the greater assortment of size above the size of the finest portions of the sand in use would prove most valuable as the material is used for filling roads and occupies much the same rôle as the ground limestone unless the latter also exercises a chemical action in neutralizing the acidity previously spoken of as a cause of decay.

The proportions of the materials for the mixers has been as follows, slightly more asphalt cement being used in winter than in summer:

Weight of—	Cranford.		Barber.	
	Mixer weights.	Per cent.	Mixer weights.	Per cent.
Sand	584	75.0	637	74.3
Stone dust.....	54	6.9	60	7.0
Limestone dust.....	30	3.8	35	4.1
Asphalt cement	111	14.3	125	14.6

The proportion of stone dust is only roughly approximate to that given, as it is mixed with the sand before going to the rotaries by the barrow or cart load, and that of the limestone is not closely weighed at the Cranford yard. At the Barber yard a certain volume is added.

The percentage of asphalt cement appears to be .3 per cent. higher in the mixture of the Barber Company, but the exact differences in this direction, owing to the difficulties of exact weighing, measuring, and drawing of the asphalt gauges, is better learned from analyses of the mixtures.

ANALYSES OF SURFACE MIXTURES.

Analyses are made daily of selected samples of the surface mixture as it goes upon the street. There is of course some variation from load to load in the amount of bitumen. How large this is the following samples show:

Run of May 17, 1890, Barber Asphalt Paving Company, and May 3, Cranford Paving Company.

Serial No.	Time.	Per cent of bitumen.	
		Barber Asphalt Paving Company.	Cranford Paving Company.
3129	8 a. m.	9.43	9.49
3130	9 a. m.	10.91	9.60
3131	10 a. m.	9.93	9.43
3132	11 a. m.	10.20	10.13
3133	12 m.	10.03	9.31
3134	1 p. m.	9.94	9.50
3135	2 p. m.	10.00	9.03
3136	3 p. m.	10.30	9.58
3137	4 p. m.	10.14	.....
		10.10	9.52

There are only three samples ranging more than two-tenths per cent. from the average, which shows very good running.

In the Barber Company's works in the autumn of 1889, the percentage of bitumen was not run as high as the above determinations.

An attempt was made to have about 9.5 per cent. of bitumen in the mixture. Following are some data:

Per cent. of bitumen in surface mixture.

Date.	Cranford Company.			Barber Company.		
	Average.	Highest.	Lowest.	Average.	Highest.	Lowest.
1889.						
October.....	9.57	10.69	8.63	9.11	9.63	8.43
November.....	9.69	10.35	8.98	9.54	9.54	9.52
December.....	9.76	10.60	9.34	9.45	10.21	8.85
1890.						
January.....	10.05	11.06	8.57	9.97	10.82	8.96
February.....	9.65	10.51	8.98	9.68	10.10	9.02
March.....	9.40	10.02	9.10			
April.....	9.74	10.47	9.40			
May.....	9.52	10.22	8.66	9.90	10.87	9.17

The proportion of extremes in the analyses is as small as in the runs previously given as a whole the material is fairly constant. That used in April by both companies was the richest, and with the cool wind of this and other winter months it is always intended to add somewhat more cement.

The percentage of asphalt cement may be roughly derived from the above figures by adding one-half, since the material not bituminous in the cement, forms a little more than one-third.

In previous years the percentage of bitumen, and consequently of cement, in the surface mixtures has varied somewhat from the above figures.

When I came to this office the mixture averaged only 9 per cent. of bitumen. This continued for the summers of 1887 and 1888, but in 1889 the increase to the present proportion was made as I was convinced that the material was not rich enough. Experience and information was derived partly from practice in other cities and from analysis of some of the old surfaces in Washington presenting different characteristics, some of the results of which are as follows:

Location.	Condition.	Bitumen.	Limestone.
Eleventh street NW., between Scott Circle and O Street	Cracked and rotten...	9.00	2.65
Island avenue, between Fourteenth and Fifteenth streets, NW.	Good	10.68	11.43
Arlington Hotel, Vermont avenue (1888)	Fine	11.26	12.10
Arlington Hotel, Vermont avenue (1890)	do	11.89	
Street, between Eleventh and Fourteenth, NW	Bad	6.83	
Street, between Fourteenth and Fifteenth streets, NW	do	7.38	

The surfaces with little bitumen are in bad condition, while the rich Vermont Avenue pavement at the Arlington Hotel is the best in the city. It is even richer in bitumen than any we have laid of late, and at the same time has from three to four per cent. as much limestone dust. Experiments show in the laboratory that with increase in cement or softness of cement limestone must be added to prevent too great brittleness. I shall therefore recommend the increase of lime, at least experimentally, for the year and the use of more and softer cement.

INSPECTION AT THE WORKS.

At the works of the contractors, where it is impossible for me to be present more than for a short time once a day, an inspector is on duty under my direction to report to those in authority and suggest such changes as are necessary for conformity with the specifications. He prepares the samples of cements, oils, surfaces, and other

materials for my examination, and makes a daily report of the operations of works and the nature and amount of material used. His duties are well explained by an examination of the following reports:

YARD REPORT.

THURSDAY, September 25, 1890.

The Cranford Paving Company.

31 topping loads to Eighteenth and New York avenue.
11 topping loads to F and Ninth streets.

Topping temperature, °F.

Asphalt.	Sand.	Mixture in cart.
320	280	270
320	285	272
320	280	270

Cement in use from Barber's kettle, No. 3. Penetration, 90.
9 binder loads to F and Ninth streets. Tar temperature, 212° F.
7 cart loads broken stone to Connecticut avenue, between H and I.
Sand and stone received, quality good.
46,880 pounds asphalt cement received from the Barber Asphalt Paving Company.

YARD REPORT.

FRIDAY, September 26, 1890.

The Barber Asphalt Paving Company.

No material sent out to-day.

Cargo of asphalt per bark *Frances*, and now discharging at wharf; quality apparently good.

Dissolving some 20 barrels or more Teneriffe refined in one of the old refining kettles for binder.

Still No. 2 oiled with a mixture of Lima and Seranton oil, 17,690 pounds, being 14 pounds to the 100 pounds crude asphalt. Penetration, 88; oil from tanks Nos. 1 and 2, car Nos. 4747, 13484, 4207, 7838, and 10234.

YARD REPORT.

MONDAY, September 29, 1890.

The Barber Asphalt Paving Company.

Twenty-six binder loads to I street, between Twenty-first and Twenty-second streets.

Tar temperature 300° Fahr.

Tar penetration 83.

Eighty-four topping loads to I street, between Twenty-first and Twenty-second streets.

Topping Temperature, °F.

Asphalt.	Sand.	Mixture on cart.
315	320	280
315	320	300
320	315	290
320	300	285
320	300	290

Cement in use from receiving tanks 12 and 15, refining still No. 4. 22,820 pounds asphalt cement forwarded to the Cranford Paving Company, from receiving tank 16, refining still No. 2, penetration 77.

Stone received, quality good.

	Pounds.
Weight of sand in sand box.....	637
Weight of stone dust.....	60
Weight of limestone dust.....	35
Weight of asphalt cement.....	125

With careful reports of this description, and a laboratory examination of the specimens collected an accurate history of the work upon the different streets can be recorded. This is now done in a book kept for this purpose and will supply data of great value in future years.

BINDER.

For the binder there has been no difficulty until the present year in obtaining tar known as No. 4 paving cement, although the quality has been very inferior. Now the supply is so small as at times to fail. As a substitute oiled asphalt cement with a penetration of about 175 degrees has been successfully used. It must, of course, be heated hotter than the tar binder, but otherwise can be handled in the same way. Mixtures of tar and asphalt do not work well and it is much better to use the two cements quite separately.

TAR SURFACE.

The scarcity of tar and its inferior quality has in the natural course of events done away with tar surfaces. But one piece was laid during the year, a crown upon K street from Vermont avenue to Connecticut avenue, which has done fairly well except at the skin edges. It contained, as shown by analysis:

Date.	Pounds asphalt to 100 tar.	Penetration.	Soluble CS ₂ .	Organic.
Aug. 27.....	32	84°	11.00	14.08
Aug. 27.....	32	84°	10.45	14.25
Aug. 28.....	32	60°	10.03	13.60

This cement seems too hard for good winter surface on the 28th and about right on the 27th. I am inclined to believe the majority of the cement in use was of correct consistency, the sample of the 28th not being representative and the resulting surface quite as good as can at present be expected.

The great difficulties previously met with in laying tar pavements were connected with the uncertainty of composition and consistency of the tar. Now that the penetration machine is available much of this might be done away with. We find No. 4 paving composition, from the Warren Works, with penetrations between 65° and 300°. In former years these would all be treated alike. Now we should add different percentages of asphalt and obtain a definite cement with our testing machine.

As tar is no longer available in large amount, this consideration ceases to be important.

ASPHALT BLOCKS.

The manufacture of asphalt blocks has not been under my inspection, but from examinations of the finished block and of the asphalt used in their manufacture it is plain that everything in connection with this industry is extremely crude and that vast improvements are possible. I would suggest more definite specifications for the control of method of making the paving block to be supplied the District.

SIDEWALKS FROM OLD SURFACE.

The attempt of the Barber Asphalt Paving Company to work over the old surface material from Pennsylvania avenue into a sidewalk of acceptable quality and at a reasonable price has been a failure.

This is due to mechanical and physical difficulties entirely, since on the small scale the laboratory there is no trouble in softening the old material and bringing it into excellent condition for use.

The apparatus in use in practice heated the material too slowly, volatilized much of the oil, and left the product in a bally condition. The time of heating extended over several hours, when in fact it should be accomplished in a few minutes. The surface used was not favorable for the experiment, the sand of which it was composed being very fine and loamy and with a tendency to ball and work in a doughy manner.

The following were some of the proportions used:

First mixture, on First street between B and C northwest, November 2.—3,500 pounds old surface heated and 120 pounds oiled asphalt added. Carried to mixer and mixed in following proportions: 425 pounds of above, 75 pounds of limestone grit, 10 pounds of asphalt cement.

This mixture was dry, bally, cold, and handled badly.

Second mixture, November 6.—Substituted residuum oil for the 10 pounds of asphalt. This was too sticky and oily.

Third mixture, on Sixth street, at F southwest, November 25.—3,500 pounds old surface heated, 60 pounds of oil added in heater. Mixer not used. No limestone.

This worked fairly well, but it is somewhat soft in summer. Doing away with the use of the mixer proved a great advantage and the limestone grit was sifted on the surface and rolled in.

Fourth mixture, Thirty-fifth street, Georgetown, at Prospect, and one-half block toward N street (the remaining half being new and fresh asphalt surface, the same as for street).—3,000 pounds of old surface; 250 pounds of limestone grit; 125 pounds of oiled asphalt, penetration 100°; 20 pounds of residuum oil, Lima; not put through mixer.

This gave a fairly satisfactory result, but proved more costly than new surface.

I can see no reason why, with proper mechanical devices, the old surface can not be reworked, but believe none of the arrangements provided for the present experiments were suitable.

Very many more minute details of methods of work and results of investigation might be added but they seem to be too much of a purely scientific interest, perhaps as yet not sufficiently well ascertained to find a place in this report. With every year's experience, however, certain facts are becoming so thoroughly fixed that in time it may be possible to publish a definite statement in regard to the most advantageous methods of working in the asphalt paving industry.

THE HERDIC PHÆTON COMPANY.

In concluding my report upon concrete pavements, I desire to again emphasize the fact to which I have previously drawn the attention of your predecessor that the herdics do an extremely large amount of damage to such of the streets as they travel. The statement of the inspector of minor repairs will show how great a difference there is between the repairs on streets over which the herdics run and other streets of similar age. As the street railway companies are required to keep their portion of the streets in repair it would seem reasonable that the herdic company, now securing a very valuable franchise for a mere nominal license, should contribute a proper proportion to the paving of streets over which their vehicles travel.

Respectfully submitted.

CLIFFORD RICHARDSON,
Inspector of Asphalt and Cements.

To the ENGINEER COMMISSIONER, &c.

REPORT OF INSPECTOR OF GAS AND METERS.

OFFICE OF THE U. S. INSPECTOR OF GAS AND METERS,
Washington, D. C., October 8, 1890.

GENTLEMEN: I have the honor herewith to submit the annual report of this office, showing its operation for the fiscal year ending June 30, 1890.

At its commencement will be found condensed tables, giving the illuminating power and purity of the gas furnished by the gas companies during the year.

Full monthly statements will be found in Tables A and B. In the remaining tables, lettered C, D, E, and F, the monthly inspection of meters and the pressure of the gas are fully stated.

Very respectfully,

S. CALVERT FORD,
Inspector of Gas and Meters.

The COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

ILLUMINATING POWER AND PURITY.

The illuminating power and purity of the gas supplied by the Washington Gas-light Company from June 24, 1889, to June 23, 1890, were as follows:

Average illuminating power during the year.....candles..	18.00
Highest illuminating power during the year.....do....	21.01
Lowest illuminating power during the year.....do....	16.02

On September 26, 1889, the highest candle power was found.

On July 15, 1889, the lowest candle power was found.

Average quantity of ammonia in 100 cubic feet during the year.....grains..	1.97
Highest quantity of ammonia in 100 cubic feet during the year.....do....	4.96
Lowest quantity of ammonia in 100 cubic feet during the year.....do....	.17

On August 31, 1889, the highest quantity of ammonia was found.

On December 30, 1889, and January 18, 1890, the lowest quantities of ammonia were found.

Average quantity of sulphur in 100 cubic feet during the year.....grains..	11.77
Highest quantity of sulphur in 100 cubic feet during the year.....do....	27.33
Lowest quantity of sulphur in 100 cubic feet during the year.....do....	4.12

On November 30, 1889, the highest quantity of sulphur was found.

On December 12, 1889, the lowest quantity of sulphur was found.

DEFAULTS DURING THE YEAR.

On six occasions the gas supplied by the Washington Gaslight Company contained more sulphur than the 20 grains allowed.

PRESSURE OF THE GAS.

The pressure of the gas supplied by this company as recorded in the inspector's office, Post Building, corner Tenth and D streets, northwest, during the hours that street lamps were lighted, from July 1, 1889, to June 30, 1890, was as follows:

Average pressure.....inches..	1.20
Highest pressure.....do....	2.10
Lowest pressure.....do....	.78

On December 24, 1889, the highest pressure was recorded.

On July 22, 1889, the lowest pressure was recorded.

SPECIFIC GRAVITY.

The specific gravity of the gas supplied by this company from July 1, 1889, to June 30, 1890, was as follows:

Average specific gravity.....	.563
Highest specific gravity.....	.614
Lowest specific gravity.....	.514

The illuminating power and purity of the gas supplied by the Georgetown Gas-light Company, from June 24, 1889, to June 23, 1890, were as follows:

Average illuminating power during the year.....candles..	17.03
Highest illuminating power during the year.....do....	19.94
Lowest illuminating power during the year.....do....	13.28

On September 9, 1889, the highest candle power was found.

On July 11, 1889, the lowest candle power was found.

Average quantity of ammonia in 100 cubic feet during the year.....grains..	2.09
Highest quantity of ammonia in 100 cubic feet during the year.....do....	7.52
Lowest quantity of ammonia in 100 cubic feet during the year.....do....	.45

On December 18, 1889, the highest quantity of ammonia was found.

On June 13, 1890, the lowest quantity of ammonia was found.

Average quantity of sulphur in 100 cubic feet during the year.....grains..	13.33
Highest quantity of sulphur in 100 cubic feet during the year.....do....	24.63
Lowest quantity of sulphur in 100 cubic feet during the year.....do....	6.62

On March 12, 1890, the highest quantity of sulphur was found.

On July 5, 1889, the lowest quantity of sulphur was found.

DEFAULTS DURING THE YEAR.

On ten occasions the illuminating power of the gas supplied by this company was less than 16 candles.

On four occasions the quantity of ammonia found exceeded the 5 grains allowed.

On four occasions the quantity of sulphur found exceeded the 20 grains allowed.

PRESSURE OF THE GAS.

The pressure of the gas supplied by this company as recorded in the inspector's office, No. 1338 Thirty-second street, Georgetown, during the hours that street lamps were lighted, from July 1, 1889, to June 30, 1890, was as follows:

Average pressure	inches..	1.54
Highest pressure	do....	4.77
Lowest pressure	do....	.86

On February 21, 1890, the highest pressure was recorded.

On November 14, 1889, the lowest pressure was recorded.

SPECIFIC GRAVITY.

The specific gravity of the gas supplied by this company from July 1, 1889, to June 30, 1890, was as follows:

Average specific gravity .....	.531
Highest specific gravity .....	.596
Lowest specific gravity .....	.458

INSPECTION OF METERS.

One thousand two hundred and eighty-three meters were inspected and proved by this office from June 24, 1889, to June 23, 1890.

With the exception of 7 meters inspected and proved for the Alexandria Gas Works, the above number was inspected and proved for the Washington and Georgetown Gaslight Companies and for consumers of gas in Washington and Georgetown.

The results of inspection were as follows: 76 registered fast, average error, 4.01 per cent.; 43 registered slow, average error, 6.43 per cent.; 1,163 registered within the limits allowed, namely, 2 per cent. either way and 1 did not register, the gas flowing through it.

Eighty-three of the above-mentioned meters were inspected and proved on complaint.

Sixty-nine were complained of by consumers of gas, of this number 30 registered fast, average error, 4.74 per cent.; 14 registered slow, average error, 4.55 per cent.; 25 registered within the limits allowed, namely, 2 per cent. either way.

Fourteen were complained of by the gas companies, 7 registered fast, average error, 3.61 per cent.; 2 registered slow, average error, 22.93 per cent.; 5 registered within the limits allowed.

The sum of \$645 was received as fees for meter inspections from June 24, 1889, to June 23, 1890, and paid to the collector of the District of Columbia to be placed to the credit of the United States and District of Columbia in equal parts.

The gas supplied by the Washington Gaslight Company during the year ending June 23, 1890, was of higher illuminating power than during any previous year since inspection has been in operation, the average illuminating power having equaled 18 standard candles.

A series of photometric tests were made during the year with flat-flame burners, commonly known as Bats-wing and fish-tail burners, to ascertain their relative value as light producers as compared with the light obtained with the standard argand.

The Bray No. 7, union jet, and the Chamberlain governor burners were selected for this purpose and adjusted to a consumption of 5 cubic feet per hour. The average illuminating power obtained was found to equal 24.30 standard candles.

Tests were also made with the brass pillar, Rappleye governor, Bray No. 7, slii union, and Ellis's screw-check burners. These burners were adjusted to a consumption of 6 cubic feet per hour, the average illuminating power obtained was found to equal 27.63 standard candles.

The candle power obtained with the burners consuming 5 cubic feet per hour was taken as a basis of comparison with the average candle power of the standard argand burner, namely, 18 candles; this was done as the act regulating gas works in this District requires that the candle power value of the gas furnished shall be determined by "consuming 5 cubic feet per hour." The flat-flame burners consuming 5 cubic feet per hour yielded 35 per cent. more light than that furnished by the standard argand.

Flat-flame burners being generally used by consumers for the purpose of illumina-

tion, the result of the experimental tests made with this class of burners shows that they are the best suited for obtaining the maximum illuminating power from the mixed coal and water gas manufactured in Washington.

The gas supplied by the Georgetown Gaslight Company during the past year was more uniform in illuminating power and purity than during the year ending June 23, 1889. As a result of this improved condition fewer defaults in the candle-power and purity standards occurred, notwithstanding the frequent interruptions the company was subjected to by the laying of the large water main on M street.

The consumption of gas in Georgetown is steadily increasing, and it will soon be necessary for the company to replace the mains on some of the principal thoroughfares with those of more ample capacity.

The recommendations made in the annual report of this office for the year 1889, that a laboratory be established in the vicinity of the new gas works in Southeast Washington, and provided with the necessary instruments for inspection, is renewed.

It is desirable that the illuminating power, purity, and pressure of the gas supplied by the Washington Gaslight Company from its different sources of supply be ascertained as soon as practicable.

The recommendations made in former reports of this office relative to the appointment of an assistant inspector and modifications in the clauses of the act regulating the inspection of meters are again submitted for consideration.

It is essential so that the object of inspection may be fully carried out, that meters which have been inspected, proved, and sealed by this office should again be brought in for reinspection, when the heads have been removed for any purpose whatever. There is a large number of meters of this description now in service of which this office has no record.

There is another class of meters called "company complaint meters," that is, meters that are supposed to register incorrectly by the gas companies. This office should have supervision of these meters.

This latter class of meters was formerly inspected by this office, but for want of assistance the inspection of them had to be discontinued.

A.—Report of the illuminating power and purity of the gas supplied by the Washington Gas-light Company from June 24, 1889, to June 23, 1890.

Months.	Number of observations.*	Illuminating power in sperm candles.			Quantity of ammonia in 100 cubic feet.			Quantity of sulphur in 100 cubic feet.		
		Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.
July					<i>Grns.</i>	<i>Grains.</i>	<i>Grains.</i>	<i>Grns.</i>	<i>Grains.</i>	<i>Grains.</i>
August	25	17.00	18.89	16.02	2.27	3.91	.85	12.86	19.51	8.08
September	27	18.09	20.33	16.74	3.34	4.93	2.04	10.66	15.66	8.24
October	26	18.89	20.85	17.63	2.96	4.96	.34	9.83	13.74	8.24
November	25	18.85	21.01	17.47	2.08	4.42	.34	11.38	18.68	9.06
December	27	18.42	19.32	16.91	2.53	4.42	1.36	14.23	25.55	9.61
January	24	18.49	19.82	16.95	1.91	2.72	.34	15.32	27.33	4.12
February	23	17.58	19.06	16.36	.61	1.19	.17	12.77	19.78	9.61
March	25	18.40	20.05	16.55	.67	1.36	.17	10.92	15.11	8.65
April	24	17.81	19.07	16.20	1.37	2.21	.85	11.00	20.19	7.55
May	27	17.85	19.73	16.03	1.68	2.72	.34	11.16	19.99	6.87
June	26	17.94	19.46	16.17	1.62	2.89	.85	10.79	16.07	7.55
	20	17.19	18.34	16.18	2.65	4.93	1.70	10.38	16.48	7.83
Total ..		2.99	216.11		23.69			141.30		

AVERAGE FOR THE YEAR.

Illuminating power in sperm candles:		
Mean of 299 observations*		18.00
Highest (September 26, 1889)		21.01
Lowest (July 15, 1889)		16.02
Quantity of ammonia in 100 cubic feet:		Grains.
Mean		1.97
Highest (August 31, 1889)		4.96
Lowest (December 30, 1889, January 18, 1890)		.17
Quantity of sulphur in 100 cubic feet:		
Mean		11.78
Highest (November 30, 1889)		27.33
Lowest (December 12, 1889)		4.12

*Each observation consists of twenty readings on the Bunsen photometer, at intervals of one minute.

On six occasions the quantity of sulphur found exceeded the 20 grains allowed.

B.—Report of the illuminating power and purity of the gas supplied by the Georgetown Gaslight Company from June 24, 1889, to June 23, 1890.

Months.	Number of observations.*	Illuminating power in sperm candles.			Quantity of ammonia in 100 cubic feet.			Quantity of sulphur in 100 cubic feet.		
		Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.	Mean.	Highest.	Lowest.
					Grns.	Grains.	Grains.	Grns.	Grains.	Grains.
July	25	16.79	18.41	13.28	3.38	5.31	2.76	9.38	14.56	6.63
August	27	16.84	17.65	16.22	2.48	3.46	1.21	14.89	22.00	9.75
September	26	17.36	19.94	16.06	3.72	4.25	2.97	13.58	18.16	10.18
October	24	16.84	17.95	16.01	2.48	3.07	1.89	16.51	18.16	14.60
November	16	17.12	18.85	16.01	1.83	2.64	1.27	14.19	18.63	11.86
December	24	16.41	17.21	15.63	3.47	7.52	2.04	17.62	19.67	15.88
January	23	17.00	19.08	15.49	1.64	2.63	.78	14.66	20.05	9.91
February	25	17.42	19.03	15.93	.96	1.08	.73	13.06	21.46	9.23
March	24	17.24	18.67	16.46	1.24	2.05	.80	14.07	24.63	10.46
April	27	17.24	18.68	13.70	1.81	2.75	1.15	11.33	16.13	9.50
May	26	17.67	19.11	16.25	1.12	1.53	.87	9.85	11.32	8.61
June	20	16.58	18.12	14.33	1.03	1.70	.45	10.88	15.56	8.06
Total ..	287	204.41			2.09			160.00		

AVERAGE FOR THE YEAR.

Illuminating power in sperm candles:		
Mean of 287 observations *	.....	17.03
Highest (September 9, 1889) .....	.....	19.94
Lowest (July 11, 1889) .....	.....	13.28
Quantity of ammonia in 100 cubic feet:		Grains.
Mean .....	.....	2.09
Highest (December 18, 1889) .....	.....	7.52
Lowest (June 13, 1890) .....	.....	.45
Quantity of sulphur in 100 cubic feet:		
Mean .....	.....	13.33
Highest (March 12, 1890) .....	.....	24.63
Lowest (July 5, 1889) .....	.....	6.62

* Each observation consists of twenty readings on the Bunsen photometer, at intervals of one minute.

On ten occasions the illuminating power was less than 16 candles. On four occasions the quantity of ammonia found exceeded the 5 grains allowed. On four occasions the quantity of sulphur found exceeded the 20 grains allowed.

C.—Report of meters inspected and proved for the Washington Gaslight Company and for consumers of gas in Washington from June 24, 1889, to June 23, 1890.

Months.	Meters tested.	New meters for company.				Repaired meters for company.			Consumers' meters on complaint of consumers.				Consumers' meters on complaint of company.							
		Total.	Fast.		Slow.	Correct.	Total.	Fast.		Correct.	Total.	Fast.		Slow.	Correct.	Total.	Fast.			
			No.	P. ct.				No.	P. ct.			No.	P. ct.					No.	P. ct.	No.	P. ct.
July	115	103	5	3.24	4	4.06	94	8	8	4	2	3.94	1	6.00			
Aug	82	76	5	4.32	2	3.25	69	4	.....	4	2	.....	2	4.44	.....	.....		
Sept	108	103	2	2.50	.....	.....	101	5	.....	5	.....	.....	.....	.....	.....	.....
Oct	118	116	2	4.47	3	3.58	111	2	.....	2	.....	.....	.....	.....	.....	.....
Nov	100	93	.....	.....	2	2.68	91	1	.....	1	6	.....	1	3.50	5	.....			
Dec	103	88	1	2.50	4	3.74	83	2	2	12	8	4.60	2	9.12	2	1	3.54		
Jan	113	97	9	3.53	1	3.33	87	14	.....	14	2	.....	2	3.41	.....	.....		
Feb	89	71	2	3.04	.....	.....	69	9	.....	9	9	6	5.12	.....	3	.....			
Mar	60	50	50	5	1	3.25	4	5	2	4.62	1	3.50	2		
Apr	58	48	3	3.54	45	7	7	3	1	3.83	1	5.33	1			
May	54	50	.....	.....	1	2.50	49	2	.....	2	2	1	3.50	.....	1	.....			
June	66	63	63	1	1	1	1	1	1	3.50		
Total.	1,066	958	29	*3.39	17	*3.44	912	60	1	*3.25	59	46	20	*4.26	10	*5.04	16	2	2	*3.52

* Average per cent.

during the fiscal year ending June 30, 1890, this office inspected and proved for the Washington Gaslight Company and for consumers of gas in Washington 1,066 meters, of this number 52 registered fast, average error 3.80 per cent.; 27 registered slow, average error 4.24 per cent., and 987 registered within the limits allowed by law, namely, 2 per cent. either way. Seven meters were inspected and proved for the Alexandria Gas Works; 2 registered fast, average error 5 per cent.; 1 registered slow, error 4 per cent., and 4 registered within the limits allowed by law.

Report of meters inspected and proved for the Georgetown Gaslight Company and for consumers of gas in Georgetown, from June 24, 1889, to June 23, 1890.

Month.	Meters tested.	New meters for company.			Repaired meters for company.						
		Total.	Slow.	Correct.	Total.	Fast.	Slow.	Correct.			
			No.	Per ct.		No.	Per ct.	No.	Per ct.		
August.....	26				26	4	3.20	4	7.73	17	
September.....	33				31	3	3.87	1	3.66	27	
October.....	21				21			3	3.90	18	
November.....	7	2		2	2					2	
December.....	39	12		12	25	1	4.62			24	
January.....	18	12	1	2.50	11						
February.....	27				19			1	4.80	16	
March.....	1										
April.....	3										
May.....	13				4					4	
June.....	28				28	1	3.25			27	
Total.....	1										
Total.....	217	26	1	*2.50	25	156	9	*3.73	9	*5.02	137

Month.	Consumers' meters on complaint of consumers.				Consumers' meters on complaint of company.			
	Total.	Fast.	Slow.	Correct.	Total.	Fast.	Slow.	Correct.
		No.	Per ct.	No.	Per ct.	No.	Per ct.	
August.....	1				1	1	3.25	
September.....	1				2	1	3.75	
October.....	2	1	4.37		1			1
November.....	2	2	3.75		4	2	3.68	2
December.....	4	2	3.21		4	1	4.16	3
January.....	1			1				
February.....	3	2	9.51	1				
March.....	8	3	5.27	3	4.07	1		1
April.....	1			1	4.06			
May.....	1							
Total.....	23	10	*5.22	4	*4.06	9	12	5
Total.....								

*Average per cent.

Consumers' meters on complaint of company that did not register; repaired meter don't register.

during the fiscal year ending June 30, 1890, this office inspected and proved for the Georgetown Gaslight Company and for consumers of gas in Georgetown, 217 meters; this number 24 registered fast, average error 4.22 per cent.; 16 registered slow, average error 3.62 per cent.; 176 registered within the limits allowed, namely, 2 per cent. either way, and one did not register the gas flowing through it.

E.—Report showing the pressure of the gas supplied by the Washington Gaslight Company, as registered in this office, Post Building, corner Tenth and D streets, from July 1, 1889, to June 30, 1890.

Month.	Mean.	Maximum.	Minimum.
July	1.12	1.58	.78
August	1.18	1.38	.97
September	1.19	1.47	.92
October	1.14	1.56	.86
November	1.22	1.91	.90
December	1.32	2.10	.78
January	1.23	1.74	.78
February	1.24	1.60	.88
March	1.22	1.50	.89
April	1.19	1.53	.87
May	1.18	1.48	.91
June	1.24	1.51	.99
	14.47		

Inches.

Average mean pressure	1.20
Maximum pressure (December 24, 1889)	2.10
Minimum pressure (July 22, 1889) .....	.78

The above record represents the pressure of the gas during the hours that street lamps were lighted.

F.—Report showing the pressure of the gas supplied by the Georgetown Gaslight Company as registered in this office, High street, Georgetown, from July 1, 1889, to June 30, 1890.

Month.	Mean.	Maximum.	Minimum.
July	1.38	1.97	1.07
August	1.39	2.04	1.13
September	1.36	2.10	1.05
October	1.40	1.95	1.20
November	1.27	2.49	.86
December	1.57	4.13	1.24
January	1.54	4.76	1.06
February	1.70	4.77	1.09
March	1.69	3.38	1.16
April	1.61	4.25	1.22
May	1.81	3.34	1.34
June	1.77	2.55	1.29
	18.49		

Inches.

Average mean pressure	1.54
Maximum pressure (February 21, 1890)	4.77
Minimum pressure (November 14, 1889) .....	.86

The above record represents the pressure of the gas during the hours that street lamps were lighted.

REPORT OF SUPERINTENDENT OF WATER DEPARTMENT.

WASHINGTON, November 12, 1890.

SIR: I have the honor to submit the following report of the extension and maintenance of the distribution branch of the water department for the fiscal year ending June 30, 1890.

Since the completion of the new 48-inch main and its connecting branches by the United States, and the readjustment of the water valves in the distribution system to give the higher elevations so far as possible their proportion of the increase in the water supply, complaints of the scarcity of water have been comparatively few. In some cases the cause of complaint was due to defective or obstructed service pipes to premises, in others to the want of the necessary head of water in the service mains

on the high elevations in the northwestern section of the city. Attention was given to all complaints, and where it was found practicable the remedy was promptly applied by the water department.

The Gaskill pumping engines and boilers at the U-street station are in a satisfactory condition. Since the high service district east of Rock Creek and south of Boundary was superseded, in March last, by the supply of water from the new 48-inch main, the pumping engines have been used expressly for the standpipe area north of Boundary, and when not in service, have been held in readiness to supply the standpipe in case of fire in the said area.

The pumping engines and boilers at the Georgetown station have been kept in good repair. The tubes in the surface condenser to the Blake engines were found to be leaking; they have been expanded at the tube-sheets and made perfectly tight.

The consumption of fuel at this station has been excessive, when compared with that of pumping engines of modern construction. During the past five months 150 premises, including the stables of the Metropolitan Railroad Company, were taken from the high service area and supplied from the gravity service; since that time the consumption of fuel has been reduced considerably. If the Georgetown station is to be continued for any length of time, the smoke-stack should be extended 25 feet, and a new 12-inch delivery main laid from the pumping engines to Thirty-second and U streets connecting with the reservoir on Thirty-second street near U, and with the present 10-inch delivery and service mains on Thirty-second opposite the reservoir, and at Thirty-second and U streets. The proposed improvements would necessitate an expenditure of \$5,562, which would effect a further saving in fuel and relieve the pumping engines of considerable friction and concussion with which they now have to contend in delivering the supply of water required for the high-service area with the present 10-inch main.

There are now 252 public hydrants in Washington and Georgetown. Eleven new improved hydrants were erected and 788 repairs were made during the year. The improved hydrants are much more satisfactory and less wasteful than those heretofore introduced into the water service.

There are 39 drinking fountains in use, 3 of which were recently furnished by the Humane Society of this city and erected by the water department. One hundred and thirteen repairs have been made during the year, and considerable attention has been given to keeping them in order. The Humane Society, owing to the want of funds, have been unable to meet the demand for more fountains. These drinking fountains, although inadequate in number, have been a source of great mercy and relief to animals, especially during the heated term. The efforts that have been made by the Humane Society for several years to provide drinking places for animals deserve high commendation, and should receive encouragement and support from the District government.

I would recommend that an annual appropriation of \$2,000 be provided for the purchase, replacement, and repairs of public drinking fountains. The object is a beneficial one and should receive favorable consideration.

There are now 1,080 fire hydrants in service. Twenty-three of the improved hydrants were erected and 476 repairs have been made within the year. The improved fire hydrants have given great satisfaction, and proved more efficient and reliable than any others heretofore brought into service by the fire department, and have required no repairs since their introduction into the distribution system.

There are now 271 public pumps in the District. Twenty-seven new "Common Sense" pumps were erected and 415 repairs have been made. Seventeen wells were filled and abandoned on the chemical evidence of their permanent pollution. Whenever the chemical analysis indicated that the water was polluted, or of suspicious quality, the surroundings of the well were carefully examined and in almost every instance the source of contamination could be traced to surface or sewage drainage, causing a gradual impurity of the soil to a considerable depth. In such cases, after repeated attempts to cleanse, it was found impossible to change the character of the water to any extent. Every precaution has been taken to preserve the wells that were found in a passably wholesome condition.

Prof. Clifford Richardson, the chemist of the engineer department, in his report of 1889, says: "What I should urgently recommend would be that Congress would be asked to increase the appropriation for wells and pumps to such an amount that in those portions of the city where they are most in need, and where it is possible, a number of deep wells be sunk by boring, and cased to the bottom with iron pipe so as not to admit of the possibility of surface contamination."

I fully concur in Mr. Richardson's recommendation, realizing that it is the only method by which water can be obtained within the city limits for pumps that will prove wholly safe and suitable for domestic use. I would recommend that the annual appropriation for the purchase of pumps and the care of wells be increased to \$6,000 and that \$1,000 of the same be used for sinking wells to a considerable depth

by boring, and lining them with iron pipe, and erecting pumps adapted for deep-well service.

It will only be necessary for me to mention briefly the importance of bringing an increased supply of water to meet the present and increasing demand for a water supply in the closely settled environs of Washington and Georgetown, as Capt. James L. Luck has now the matter under consideration.

I would respectfully call your attention to the inadequacy of the present compensation of the employes of the distribution branch of the water department. The conditions under which they have to work are quite different from those of any other department of the District government. It requires constant vigilance on the part of this branch to keep the system of water mains in a safe and reliable condition, at times requiring from ten to thirty-six hours of continuous labor contending against water and severe weather. The remuneration of the employes in this department should be commensurate with the services rendered.

The following tabulated statements will show the details of operation of this department during the year.

Very respectfully, your obedient servant,

H. F. HAYDEN,

Superintendent Water Department.

Col. HENRY M. ROBERT,

Engineer Commissioner District of Columbia.

During the year 2,855 feet of 3-inch, 2,856 feet of 4-inch, and 34,737 feet of 6-inch cast-iron water-main pipe was laid.

WATER MAINS.

Location.	Street or avenue.	Streets between.	Size of pipe.	Length of main.
			Inches.	Linear feet.
In alley.....	Tenth and Eleventh..	M and N, NW	3	512
Do.....	Seventh and Eighth..	E and F, SW	3	168
Do.....	Fourth and Fifth.....	Washington and G, NW	3	120
North side.....	South Carolina avenue	Twelfth and Thirteenth, SE	3	48
In alley.....	First and Second.....	C and D, SE	3	177
Do.....	Twelfth and Thirteenth.	G and I, SE	3	326
Do.....	Fifteenth and Sixteenth.	K and L, NW	3	258
Do.....	North Capitol and First.	...do	3	267
Do.....	Sixth and Seventh....	G and I, SE	3	298
Do.....	Twelfth and Thirteenth.	D and E, SE	3	353
Do.....	Third and Fourth.....	E and F, NE	3	338
Do.....	Sixth and Seventh....	Callan and L, NE	4	650
Center.....	Hopkins street	Twentieth and Twenty-first, O and P, NW.	4	168
South side.....	R street	Marion and Sixth, NW	4	347
East and west side.	Second street	C and D, SW	4	528
In alley.....	Twelfth and Thirteenth.	T and U, NW	4	413
Do.....	Thirty-second and Thirty-third.	Grace and Water, NW	4	649
Center.....	Hopkins street	Twentieth and Twenty-first, O and P, NW.	6	32
Do.....	Ridge street.....	Fourth and Fifth, M and N, NW	6	769
Center.....	Tenth street	Georgia avenue and M, SE	6	267
East and west side.	Eighteenth street....	P and Q, NW	6	1,064
Do.....	Fourteenth street....	Chapin and Binney	6	1,356
Center.....	Fifth street	H and I, NE	6	248
West side.....	Twenty-second street.	K and L, NW	6	346
North side.....	Washington Circle...	Twenty-second and New Hampshire avenue.	6	264
East and west side.	New Hampshire avenue.	Washington Circle and L.....	6	520
North side.....	N street	Seventeenth and Eighteenth, NW	6	854
Center.....	V street	Fourteenth and Portner Place, NW	6	427
Do.....	Franklin street	New Jersey avenue and Fifth, P and Q, NW.	6	563
Do.....	G street	Eleventh and Twelfth, SE	6	239

WATER MAINS—Continued.

Location.	Street or avenue.	Streets between.	Size of pipe.	Length of main.
			Inches.	Linear feet.
and south side.....	Massachusetts avenue.....	Ninth and Tenth, NE.....	6	648
side.....	Maryland avenue.....	First and Second, NE.....	6	484
side.....	E street.....	Third and Fourth, NE.....	6	405
side.....	Sixth street.....	L and M, SE.....	6	319
side.....	C street.....	Thirteenth and Tennessee avenue, NE.....	6	324
side.....	I street.....	Third and Canal, SE.....	6	334
side.....	Seventh street.....	G and H, NE.....	6	424
side.....	K street.....	First and Third, SE.....	6	876
side.....	L street.....	Four-and-a-half and Sixth, SW.....	6	617
side.....	Fifteenth street.....	T and U, NW.....	6	428
side.....	M street.....	First and New York avenue, NW.....	6	260
side.....	E street.....	Sixth and Seventh, NE.....	6	677
side.....	Massachusetts avenue.....	Third and Fourth, NE.....	6	444
side.....	F street.....	do.....	6	384
side.....	Fourth street.....	E and F, NE.....	6	430
and south side.....	I street.....	Third and Fourth, SE.....	6	757
and west side.....	Third street.....	E and F, SW.....	6	674
side.....	Florida avenue.....	Fourteenth, to alley.....	6	175
and south side.....	Virginia avenue.....	Twenty-third and Twenty-fourth, NW.....	6	577
side.....	U street.....	Thirty-fifth and Thirty-seventh, NW.....	6	968
side.....	K street.....	North Capitol and First, NW.....	6	780
side.....	P street.....	Eleventh and Twelfth, NW.....	6	236
side.....	Warner street.....	New Jersey avenue to alley, NW.....	6	142
side.....	Maryland avenue.....	Thirteenth to intersection G, NE.....	6	332
side.....	First street.....	K and L, SE.....	6	1,120
and south side.....	L street.....	First and Delaware avenue, SW.....		
side.....	Massachusetts avenue extended.....	Twenty-second and Circle, NW.....	6	1,166
and west side.....	Eleventh street.....	Park and C, NE.....	6	561
side.....	Twelfth street, extended.....	Florida avenue and M, NE.....	6	338

Water mains laid from funds deposited by applicants.

side.....	Thirteenth street.....	Maryland avenue and E, SW.....	4	201
and west side.....	Seventh street.....	Florida avenue to Market Space, NW.....	6	8,394
side.....	do.....	B to M, SW.....	6	3,456
side.....	New Jersey avenue.....	To southeast corner New Jersey avenue and D, NW.....	6	220
side.....	North Capitol street.....	C and D, NW.....	6	65
Total.....				39,875

The following cast-iron pipe was used in the erection of new fire hydrants:

	Linear feet.
1.....	300

Intersections laid on streets specified to be improved.

Location.	Size of pipe.	Length of main.
	Inches.	Linear feet.
street, New Hampshire avenue, S and T streets, NW.....	6	36
New Hampshire avenue and R street, NW.....	6	59
on avenue and R street, NW.....	6	37
on avenue and S street, NW.....	6	31
y-second and N streets, NW.....	6	72
and I streets, SE.....	6	38
Total.....		273

Four-way branches connected to water mains.

Location.	No.	Size.
		<i>Inches.</i>
In alley between Twelfth and Thirteenth, D and E, SE.....	1	3 by 3
North side Massachusetts avenue extended center Twenty-second, NW.....	1	6 by 6
North side Virginia avenue center Twenty-fourth, NW.....	1	12 by 6
<i>Four-way branches set at expense of applicants.</i>		
East side Seventh street, center I, NW.....	1	4 by 4
West side Seventh street, center I, NW.....	1	4 by 4
East side Seventh street, center F, NW.....	1	6 by 6
East side Seventh street, center G, NW.....	1	6 by 6
West side Seventh street, center K, NW.....	1	6 by 6
West side Seventh street, center N, NW.....	1	6 by 6
West side Seventh street, center P, NW.....	1	6 by 6
West side Seventh street, center Q, NW.....	1	6 by 6
East side Seventh street, center E, SW.....	1	6 by 6
East side Seventh street, center F, SW.....	1	6 by 6
East side Seventh street, center H, SW.....	1	6 by 6
East side Seventh street, center K, SW.....	1	6 by 6
East side Seventh street, center M, SW.....	1	6 by 6
Total.....	16	

Y branches connected to water mains.

Southwest corner First and M streets, NW.....	1	6
South side M street between First and New York avenue, NW.....	1	6
Center M street between First and New York avenue, NW.....	1	6
Southwest corner Fourth and F streets, NE.....	1	6
Northwest corner First and L streets, SW.....	1	6
Southwest corner First and L streets, SW.....	1	6
Northeast corner Delaware avenue and L street, SW.....	1	6
Southeast corner Delaware avenue and L street, SW.....	1	6
Southeast corner Fifteenth and U streets, NW.....	1	6
Northeast corner Fifteenth and T streets, NW.....	1	6
Total.....	10	

Tees connected to water mains.

In alley between Tenth and Eleventh, M and N streets, NW.....	1	3 by 3
In alley between Fourth and Fifth, Washington and G streets, NW.....	1	3 by 3
In alley between First and Second, C and D streets, SE.....	1	3 by 3
In alley between Sixth and Seventh, G and I streets, SE.....	1	3 by 3
Center Fenton Place, between First and North Capitol, K and L streets, NE.....	1	3 by 3
In alley between Third and Fourth, E and F streets, NE.....	1	3 by 3
North side O street, between Twentieth and Twenty-first, NW.....	1	4 by 4
Center Washington street, between Fourth and Fifth, NW.....	1	4 by 4
North side Grace street, between Thirty-second and Thirty-third, NW.....	1	4 by 4
Center Water street, between Thirty-second and Thirty-third, NW.....	1	4 by 4
In alley between Thirty-second and Thirty-third, Grace and Water streets, NW.....	2	4 by 4
Center Eleventh street, between M and N, NW.....	1	6 by 3
Center E street, between Seventh and Eighth, SW.....	1	6 by 3
Center Thirteenth street, between G and I, SE.....	1	6 by 3
Center Fifteenth street, between K and L, NW.....	1	6 by 3
Center E street, between Twelfth and Thirteenth, SE.....	1	6 by 3
West side Fourth street, between E and F, NE.....	1	6 by 3
Center Sixth street, between K and L, NE.....	1	6 by 4
Center Seventh street, between K and L, NE.....	1	6 by 4
Center Eighth street, north side S, NW.....	1	6 by 4
Center Twelfth street, between T and U, NW.....	1	6 by 4
Center Eighth street, north side Q, NW.....	1	6 by 4
Southeast corner First and K streets, NW.....	1	6 by 4
North side R street, center New Hampshire avenue, NW.....	1	6 by 6
Center M street, between Fourth and Fifth, NW.....	1	6 by 6
Northwest corner Fourteenth street and Euclid avenue, NW.....	1	6 by 6
Center M street, between Sixth and Seventh, NW.....	1	6 by 6
Northeast corner Vermont avenue and Iowa Circle, NW.....	1	6 by 6
Center Johnson avenue and R street, NW.....	1	6 by 6
Center Fifth street, between M and N, NW.....	1	6 by 6
Northeast corner Eighteenth and P streets, NW.....	1	6 by 6
Southeast corner Eighteenth and P streets, NW.....	1	6 by 6
Center Yale street, east side Fourteenth, NW.....	1	6 by 6
East side Fourteenth street, center Binney, NW.....	1	6 by 6
Southwest corner Twenty-second and L streets, NW.....	1	6 by 6
Northwest corner Twenty-second and K streets, NW.....	1	6 by 6
North side K street, center Twenty-second, NW.....	1	6 by 6
Southeast corner New Hampshire avenue and L street, NW.....	1	6 by 6
Center V street and Porter Place, NW.....	1	6 by 6
East side Fifth street, between P and Q, NW.....	1	6 by 6

Tees connected to water mains—Continued.

Location.	No.	Size.
		<i>Inches.</i>
Northeast corner New Jersey avenue and K street, NW	1	6 by 6
South side Massachusetts avenue, center Tenth street, NE	1	6 by 6
South side Maryland avenue, between First and Second streets, NE	1	6 by 6
East side First street, center Maryland avenue, NE	1	6 by 6
East side Fourth street, center E, NE	1	6 by 6
West side Sixth street center, L, SE	1	6 by 6
Center Tennessee avenue and C street, NE	1	6 by 6
Center I street, between Third and Canal, SE	1	6 by 6
Center Fourth street and Massachusetts ave., NE	1	6 by 6
Northeast corner Fifteenth and Corcoran streets, NW	1	6 by 6
Center F street, east side Third, NE	1	6 by 6
Center Fourth street, north side E, NE	1	6 by 6
Center Twenty-second street, south side Pennsylvania avenue, NW	1	6 by 6
Northeast corner Third and F streets, NE	1	6 by 6
Southwest corner Fourth and F streets, NE	1	6 by 6
Center L street, between Ninth and Tenth, NW	1	6 by 6
Center Union street, north side N, SW	1	6 by 6
Center G street, west side Second, SW	1	6 by 6
Center Rosedale street, west side Sixteenth, NE	1	6 by 6
Northeast corner North Capitol street and Florida avenue, NE	1	6 by 6
Center I street, east side Third, SE	1	6 by 6
Northwest corner, Fourth and I streets, SE	2	6 by 6
Southwest corner Fourth and I streets, SE	1	6 by 6
Center Third street, north side F, SW	1	6 by 6
Center Fourteenth street, south side Florida avenue, NW	1	6 by 6
Center F street, between Twenty-third and Twenty-fourth, NW	1	6 by 6
Center Virginia avenue, near Twenty-third street, NW	1	6 by 6
Center Twenty-third street, between Virginia avenue and E, NW	1	6 by 6
Northwest corner Twenty-fourth street and Virginia avenue, NW	1	6 by 6
Center Elliott street, south side Maryland avenue, NE	1	6 by 6
Center U street, west side Thirty-sixth, NW	1	6 by 6
Northeast corner Eleventh and Park streets, NE	1	6 by 6
Center Eleventh street, south side C, NE	1	6 by 6
Northeast corner Delaware avenue and L street, SW	1	6 by 6
Northeast corner Circle and R street extended, NW	1	6 by 6
Center Twelfth street extended, North side Florida avenue, NE	1	6 by 6
Center Massachusetts avenue, east side Florida avenue, NW	1	12 by 6

Tees set at expense of applicants.

West side Thirteenth street, center Maryland avenue, SW	1	6 by 4
West side Seventh street, center O, NW	1	6 by 4
East side Seventh street, south side B, SW	1	6 by 4
East side Seventh street, center D, SW	1	6 by 4
Center Florida avenue, west side Seventh street, NW	1	6 by 6
Center T street, west side Seventh, NW	1	6 by 6
West side Seventh street, center S, NW	1	6 by 6
West side Seventh street, center Rhode Island avenue	1	6 by 6
West side Seventh street, center M, NW	1	6 by 6
West side Seventh street, center L, NW	1	6 by 6
West side Seventh street, south side K, NW	1	6 by 6
West side Seventh street, center H, NW	1	6 by 6
West side Seventh street, center G, NW	1	6 by 6
East side Seventh street, south side F, NW	1	6 by 6
East side Seventh street, center E, NW	1	6 by 6
West side Seventh street, center D, NW	1	6 by 6
East side Seventh street, center D, NW	1	6 by 6
East side Seventh street, south side B, SW	1	6 by 6
East side Seventh street, center G, SW	1	6 by 6
East side Seventh street, center I, SW	1	6 by 6
East side Seventh street, center L, SW	1	6 by 6
Center North Capitol street, between C and D, NW	1	6 by 6

Total

101

Reducers connected to water mains.

Center Hopkins street between O and P, NW	1	6 by 4
Northwest corner Second and D streets, SW	1	6 by 4
Northeast corner Second and D streets, SW	1	6 by 4
Southwest corner Second and C streets, SW	1	6 by 4
Northeast corner Second and C streets, SW	1	6 by 4
Center U street, west side Thirty-fifth, NW	1	6 by 4

Reducers set at expense of applicants.

East side Seventh street, center I, NW	2	6 by 4
West side Seventh street, center I, NW	2	6 by 4
East side Seventh street, south side F, NW	1	6 by 4
Total	11	

Bends connected to water mains.

Location.	No.	Size.
		<i>Inches.</i>
Southwest corner Sixth and R streets, NW	1	4
Southeast corner Marion and R streets, NW	1	4
Northwest corner Second and D streets, SW	1	4
Southwest corner Second and C streets, SW	1	4
Southeast corner Second and C streets, SW	1	4
In alley between Twelfth and Thirteenth, T and U streets, NW	1	4
Center Twenty-second and N streets, NW	4	6
Southwest corner Eighteenth and Q streets, NW	1	6
Southeast corner Eighteenth and Q streets, NW	1	6
Northwest corner Eighteenth and P streets, NW	1	6
Southeast corner Eighteenth and P streets, NW	1	6
East side Fourteenth street, near Chapin, NW	1	6
Corner Washington Circle and K street, NW	1	6
Corner Washington Circle and New Hampshire avenue, NW	1	6
East side New Hampshire avenue, between Washington circle and L street, NW	1	6
Southwest corner New Hampshire avenue and L street, NW	1	6
Northwest corner New Hampshire avenue and Washington circle, NW	1	6
Northwest corner Eighteenth and N streets, NW	1	6
Northwest corner Seventeenth and N streets, NW	1	6
West side Seventeenth street, center N, NW	1	6
North side Maryland avenue, between First and Second, NE	1	6
Northeast corner First street and Maryland avenue, NE	2	6
North side Massachusetts avenue, center Tenth street, NE	1	6
Northeast corner Second and D streets, SW	1	6
Center First and L streets, NW	2	6
Southeast corner Third and F streets, NE	1	6
Northwest corner Fourth and E streets, NE	1	6
Northeast corner Third and I streets, SE	1	6
Southwest corner Third and I streets, SE	1	6
Northwest corner Third and F streets, SW	1	6
Northeast corner Third and F streets, SW	1	6
Southwest corner Third and E streets, SW	1	6
Southeast corner Third and E streets, SW	1	6
Northwest corner Fourteenth street and Florida avenue, NW	1	6
Center Fourteenth street, south side Florida avenue, NW	1	6
Center Twenty-fourth street, north side Virginia avenue, NW	1	6
North side Virginia avenue, near Twenty-third street, NW	1	6
South side Virginia avenue, between Twenty-third and Twenty-fourth streets, NW	1	6
Center Twenty-third street, south side Virginia avenue, NW	1	6
Southwest corner North Capitol and K streets, NW	1	6
Northeast corner Twelfth and P streets, NW	1	6
Northwest corner Eleventh and P streets, NW	1	6
Southwest corner Twenty-second street and Massachusetts avenue extended, NW	1	6
North side Massachusetts avenue extended, Circle and Twenty-second street, NW	1	6
South side Massachusetts avenue extended, Circle and Twenty-second street, NW	1	6
Southwest corner Eleventh and C streets, NE	1	6
Southeast corner Eleventh and C streets, NE	1	6
<i>Bends set at expense of applicants.</i>		
East side Seventh street, south side Boundary, NW	2	6
East side Seventh street, between T and Boundary, NW	2	6
West side Seventh street, center O, NW	1	6
West side Seventh street, south side K, NW	1	6
East side Seventh street, center F, NW	2	4
West side Seventh street, center E, NW	1	6
West side Seventh street, center C, NW	1	6
East side Seventh street, north side Louisiana avenue, NW	1	6
East side Seventh street, south side B, SW	1	4
East side Seventh street, south side B, SW	2	6
West side Seventh street, south side B, SW	1	6
West side Seventh street, center C, SW	1	6
East side Seventh street, north side Maryland avenue, SW	1	6
West side Seventh street, south side Virginia avenue, SW	1	6
East side Seventh street, south side Virginia avenue, SW	1	6
East side Seventh street, center D, SW	2	6
East side Seventh street, center E, SW	4	6
East side Seventh street, center F, SW	2	6
East side Seventh street, center H, SW	4	6
West side North Capitol, between C and D, NW	2	6
West side Thirteenth street, center Maryland avenue, SW	1	4
Total	86	

STOP VALVES.

On hundred and twenty-five stop-valve casings have been adjusted to the new grade. Ninety-two repairs have been made to stop valves. Moved the 6-inch two-way stop valve from the center of Fifteenth and Q streets, northwest, and inserted it on the east side of Fifteenth street, between Madison and Q, northwest.

valves connected to water mains and inclosed with cast-iron casings and covers over them.

Location.	No.	Size.	Way.
		<i>In.</i>	
by between Tenth and Eleventh, M and N streets, NW	1	3	2
by between Seventh and Eighth, E and F streets, SW	1	3	2
side Washington street between Fourth and Fifth, NW	1	3	2
side Thirteenth street between G and I, SE	1	3	2
side E street between Twelfth and Thirteenth, SE	1	3	2
r Sixth street between K and L, NE	1	4	2
r Hopkins street north side O, NW	1	4	2
west corner Sixth and R streets, NW	1	4	2
east corner Marion and R streets, NW	1	4	2
side Twelfth street between T and U, NW	1	4	2
side Grace street between Thirty-second and Thirty-third, NW	1	4	2
side Water street between Thirty-second and Thirty-third, NW	1	4	2
side Fifteenth street between Madison and Q, NW	1	6	2
r Fifth street between M and N, NW	1	6	2
r Ridge street, west side Fourth, NW	1	6	2
r Tenth street, North side M, NW	1	5	2
east corner Eighteenth and P streets, NW	1	6	2
east corner Fourteenth street and Euclid avenue	1	6	2
side Fourteenth street opposite Chapin, NW	1	6	2
r Twenty-second street, north side K, NW	1	6	2
west corner New Hampshire avenue and Washington Circle, NW	1	6	2
r V street and Portner Place, NW	1	6	2
r Franklin street, east side Fifth, NW	1	6	2
r Tenth street, south side Massachusetts avenue, NE	1	6	2
r Thirteenth and C streets, NE	1	6	2
r K street, west side First, SW	1	6	2
r Delaware avenue and K street SW	1	6	5
west corner Fourth street and Massachusetts avenue, NE	1	6	2
r First and L streets, NW	2	6	2
west corner Fourth and I streets, SE	1	6	2
side W street, center Fourteenth, NW	1	6	2
side Florida avenue between Fourteenth and Fifteenth streets, NE	1	6	2
side Virginia avenue, center Twenty-fourth, NW	1	6	2
r Warner street, west side New Jersey avenue, NW	1	6	2
side Maryland avenue, center Elliott street, NE	1	6	2
r Twenty-second street, north side Massachusetts avenue extended	1	6	2
west corner Florida and Massachusetts avenues, NW	1	6	2
r Sixth and E streets, NE	1	6	4
r Thirty-sixth and U streets, NW	1	6	4
side First street, center K, SW	1	6	4
r First and L streets, SW	1	6	4
r Delaware avenue and L street, SW	1	6	4
r Eleventh and C streets, NE	1	6	4
r Twelfth and M streets, NE	1	6	4
r Fourth and E streets, NE	1	6	5
r Second and K streets, SW	1	6	5
<i>Stop valves set at expense of applicants.</i>			
side Seventh street, center Boundary, NW	1	6	2
side Seventh street, center T, NW	1	6	2
side Seventh street, north side R, NW	1	6	2
side Seventh street, center R, NW	1	6	4
side Seventh street, center Q, NW	1	6	2
side Seventh street, center O, NW	1	6	2
side Seventh street, center M, NW	1	6	2
side Seventh street, center L, NW	1	6	2
side Seventh street, south side K, NW	1	6	2
side Seventh street, center H, NW	1	6	2
side Seventh street, center H, NW	1	6	2
side Seventh street, center G, NW	1	6	2
side Seventh street, center F, NW	1	6	2
side Seventh street, center D, NW	1	6	2
side Seventh street, center D, NW	1	6	2
side Seventh street, south side B, SW	1	6	2
side Seventh street, north side Maryland avenue, SW	1	6	2
side Seventh street, center D, SW	1	6	2
side Seventh street, center D, SW	1	6	2
side Seventh street, center E, SW	1	6	2
side Seventh street, center F, SW	1	6	2
side Seventh street, center I, SW	1	6	2
side Seventh street, center K, SW	1	6	2
side Seventh street, center L, SW	1	6	2
North Capitol street, between C and D, NW	1	6	2
side Thirteenth street, center Maryland avenue, SW	1	4	2
side New Jersey avenue, center D street, NW	1	6	2
Total	74		

Water mains lowered.

Location.	Size.	Length of main.
	Inches.	Feet.
Twenty-fourth and F streets, NW.....	4	125
Do.....	6	113
Johnson avenue and R street, NW.....	6	24
Virginia avenue, between Second and Third streets, SE.....	6	350
M street, between First and New York avenue, NW.....	6	49
Total.....		652

Service pipes lowered.

Location.	Length of service.
	Feet.
C street, between Eighth and Ninth, SE.....	96
Four-and-a-half street, between C and D, NW.....	35
In alley between Second and Third, K and L streets, NE.....	75
Ninth street, between C and D, SE.....	237
F street, between Twenty-fourth and Twenty-fifth, NW.....	160
Second street, between K and L, NE.....	25
Chapin street, between Fourteenth and Binney.....	125
Total.....	753

Six hundred and ninety service boxes and street washers were adjusted to grade as follows:

Maryland avenue, between Eighth and Ninth streets, NE.....	5
H street, between Eleventh and Thirteenth NW.....	19
L street, between Fifteenth and Sixteenth, NW.....	10
Eighteenth street, between L and M, NW.....	2
Four-and-a-half street, between C and D, NW.....	3
Johnson avenue, between Fourteenth and Fifteenth, R and S streets, NW.....	3
Marion street, between Sixth and Seventh, P and Q, NW.....	29
Kingman Place, between Thirteenth and Fourteenth, P and Q streets, NW.....	18
French street, between Ninth and Tenth, R and S, NW.....	25
S street, between Sixteenth and Seventeenth, NW.....	8
Seventeenth street, between F and G, NW.....	9
Ninth street, between C and D, SE.....	92
C street, between Eighth and Tenth, SE.....	13
Washington street, between Fourth and Fifth, G and H, NW.....	55
Pennsylvania avenue, between Ninth and Thirteenth SE.....	27
I street, between North Capitol and First, NW.....	49
K street, between North Capitol and First, NE.....	20
Pierce street, between North Capitol and First, L and M, NE.....	24
Sixth street, between D and F, SW.....	16
First street, between C and D, SE.....	5
D street, between First and Second, SE.....	15
Myrtle street, between North Capitol and First, I and K, NE.....	25
Sampson street, between Fourteenth and Fifteenth, P and Q, NW.....	32
Twelfth street, between S and V, NW.....	46
H street, between First and Fifteenth, NE.....	57
N street, between Fourth and Fifth, NW.....	25
L street, between First and Second, NW.....	24
Twenty-eighth street, between P and Q, NW.....	2
Twenty-ninth street, between P and Q, NW.....	6
L street, between North Capitol and First, NW.....	19
Twenty-second street, between M and O, NW.....	13
Four-and-a-half street, between Maine and Maryland avenues, SW.....	7
Thirty-third street, between N and P, NW.....	7
Eleventh street, between N and O, SE.....	3
Thirty-fifth street, between Q and U, NW.....	8
Second street, between G and H, SW.....	2
Thirty-fourth street, between N and P, NW.....	14
Second street, between C and D, SW.....	25
Total.....	690

STREET HYDRANTS.

Three hydrants have been erected in new locations, 8 have been erected in place of old ones, 1 has been removed and abandoned, 11 have been moved to the new curb line, and 788 repairs have been made to hydrants.

Erected in new locations.—Half and G streets, southwest; Sixth and M streets, southeast; Thirty-fifth and O streets, northwest.

Erected in place of old ones.—Eighth and G streets, southwest; Twentieth and M streets, northwest; Seventh and I streets, southwest; Second street and Virginia avenue, southeast; Second street, between K and L, northeast; Twenty-sixth and K streets, northwest; Eleventh street near Water, southwest; Thirtieth and U streets, northwest.

Removed and abandoned.—Seventh street, between R and S, northwest.

Moved to new curb line.—Ninth and I streets, southeast; Washington street, between Fourth and Fifth, G and H, northwest; Second street and Virginia avenue, southeast; Third and I streets, southeast; Fifth and Ridge streets, northwest; Ridge street, between Fourth and Fifth, northwest; Sampson street, between Fourteenth and Fifteenth, P and Q, northwest; Marion street, between Sixth and Seventh, P and Q, northwest; L street, between First and New Jersey avenue, northwest; First and L streets, northwest; Thirty-fifth and U streets, northwest.

FOUNTAINS.

Three new fountains, presented by the Humane Society, were erected by the water department, 1 in a new location and 2 in place of old ones. One hundred and thirteen repairs were made to fountains.

Erected in new location.—New Hampshire avenue and G street, northwest.

Erected in place of old ones.—First street and Maryland avenue, southwest; Seventh and B streets, northwest.

FIRE HYDRANTS.

Twenty-three improved fire hydrants have been erected in new locations, 3 have been changed to the new grade, 10 have been moved to the new curb line, 4 have been moved from one location and erected in another, and 476 repairs have been made to fire hydrants.

Erected in new locations.—South side M street, between Fourth and Fifth, northwest; northwest corner Fourteenth and Euclid avenue, northwest; south side M street between Sixth and Seventh, northwest; northeast corner Eighth and S street, northwest; northeast corner Vermont avenue and Iowa Circle, northwest; north side U street, between Thirtieth and Thirty-first, northwest; southeast corner Thirteenth street and Maryland avenue, northeast; northeast corner Fifteenth and Corcoran streets, northwest; southwest corner Twenty-second street and Pennsylvania avenue, northwest; southeast corner Third and F streets, northeast; southwest corner Fourth and F streets, northeast; at alley on L street, between Ninth and Tenth, northwest; northwest corner Eighth and Q streets, northwest; northwest corner Union and N streets, southwest; northwest corner Second and G streets, southwest; southwest corner Sixteenth and Rosedale streets, northeast; southeast corner North Capitol street and Florida avenue; northwest corner Fourth and I streets, southeast; northwest corner Twenty-fourth street and Virginia avenue, northwest; southwest corner Thirty-sixth and U streets, northwest; northeast corner Delaware avenue and L street, southwest; northeast corner Massachusetts avenue and R street, extended, northwest; northwest corner Twelfth street and Florida avenue, northeast.

Changed to new grade.—Chapin street, between Fourteenth and Binney, northwest; corner Seventeenth and R streets, northwest; corner South Capitol and D streets, southwest.

Moved to new curb line.—Corner Ninth and I streets, southeast; corner Eleventh and G streets, southeast; corner Ninth and C streets, southeast; Washington street, between Fourth and Fifth, F and G, northwest; corner Third street and Virginia avenue, southeast; corner Twelfth and T streets, northwest; corner Twelfth and U streets, northwest; corner First and L streets, northwest; corner Thirty-fifth and S streets, northwest; corner Thirty-fifth and T streets, northwest.

Changed from one location to another.—From north side of I street, between Second and Third, northwest, and erected on the northeast corner New Jersey avenue and K street, northwest. From north side Massachusetts avenue, between Ninth and Tenth streets northwest, and erected on the northeast corner of Massachusetts avenue and Tenth street, northwest. From the north side of R street, between Fifteenth and Sixteenth, northwest, and erected on the southwest corner of Fourteenth and Sampson streets, northwest. From west side of New Jersey avenue, between D and E streets, northeast, and erected on the northwest corner of H street and Bladensburg Road, northeast.

PUMPS.

Two new pumps have been erected in new locations. Twenty-five have been erected in place of old ones. Seventeen have been removed; wells filled and abandoned. Five have been moved to the new curb. Thirty-one wells have been cleaned. Four hundred and fifteen repairs have been made to pumps.

Erected in new location.—Seventh-street road and Irvin street, northwest; L street between Thirteenth and Fourteenth, southeast.

Erected in place of old ones.—Caroline street between Fifteenth and Sixteenth northwest; corner third and R streets, northwest; Four-and-a-half street between and D, northwest; Fourth and East Capitol streets; Harrison street (Anacostia); Monroe street (Anacostia); corner New Jersey avenue and K street, northwest; Stanton and Elvin avenues, (Hillsdale); corner Third and M streets, southeast; Twelfth street between G and H, northwest; O street between half and First, southeast; corner Fifth and Ridge streets, northwest; Sheridan avenue between Fourteenth and Brown streets; First street between N and O, southwest; Seventh-street road and Whitney avenue; corner Fourteenth and B street, southwest; corner Fourth street and North Carolina avenue, southeast; corner First and M streets southeast; New York avenue between Seventeenth and Eighteenth streets, northwest; Seventeenth street and Georgia avenue, southeast; Q street between Thirteenth and Fourteenth northwest; N street between First and New Jersey avenue, southeast; North Carolina avenue between First and Second streets, southeast; Seventeenth and A street southeast; Twelfth and E streets, northeast.

Pumps removed, wells filled and abandoned.—Fifth and I streets, northwest; Third and R streets, northwest; Four-and-a-half and M streets, southwest; in front of Pomeroy street, northwest; Four-and-a-half and F streets, southwest; Fifth street between G and H, southeast; Ninth street, between G and I, southeast; R street, between Fifth and New Jersey avenue, northwest; Eighth street, between G and I, northwest; corner Eighth and G streets, southwest; New Jersey avenue, between and M streets, southeast; corner Seventh and I streets, northeast; Half street, between N and O, southwest; corner Twelfth and O streets, northwest; K street, between Third and Four-and-a-half, southwest; corner Second and D streets, southwest; Third street, between G and H, northwest.

Moved to the new curb line.—Corner Ninth and C streets, southeast; corner Fourth and East Capitol streets; corner New Jersey avenue and Pierce street, northwest; corner Thirteenth street and Pennsylvania avenue, southeast; Thirty-fifth street, between S and T, northwest.

WELLS.

Wells cleaned.—Corner Third and R streets, northwest; corner Four-and-a-half and F streets, southwest; Third street, between H and I, northwest; Twelfth street between G and H, northwest; R street, between Fifth and New Jersey avenue, northwest; Four-and-a-half street, between C and D, northwest; Fourth and East Capitol streets; Harrison street, Anacostia; corner New Jersey avenue and K street, northwest; corner Third street and Indiana avenue, northwest; First street, between and O, southwest; corner Fifth and Ridge streets, northwest; Sheridan avenue, between Fourteenth and Brown streets, northwest; corner Fourteenth and B street, southwest; corner Twenty-third street and New York avenue, northwest; corner Fourth street and North Carolina avenue, southeast; corner First and M street southeast; New York avenue, between Seventeenth and Eighteenth streets, northwest; Half street, between N and O, southwest; F street, between First and Second, northwest; Massachusetts avenue, between First and North Capitol streets, northwest; corner Seventeenth street and Georgia avenue, southeast; corner Twelfth street and Massachusetts avenue, northwest; corner Seventh and H streets, northwest; K street between Third and Four-and-a-half, southwest; N street, between First and New Jersey avenue, southeast; Seventeenth and A streets, southeast; corner Second and D streets, southwest; corner Twelfth and E streets, northeast; D street, between Ninth and Tenth, southwest; corner Twelfth and D streets, southeast.

TRAP.

Brick traps and iron gratings set.—Corner Tenth and S streets, northwest; Pennsylvania avenue, between Twenty-first and Twenty-second streets, northwest; Twelfth street, between G and H, northwest; corner Ninth and East Capitol streets; corner Third and R streets, northwest; Caroline street, between Fifteenth and Sixteenth northwest; corner Twenty-third and G streets, northwest; corner Third and streets, southeast; Four-and-a-half street, between C and D, northwest; corner Fourth and East Capitol streets; corner Ninth and C streets, southeast; corner New Jersey avenue and K street, northwest; corner Sheridan and Sherman avenues; corner Twenty-ninth street and Dunbarton avenue; corner New Jersey avenue and Pierce street, northwest; corner Fifth and Ridge streets, northwest; corner Four

th and B streets, southwest; corner Fourth street and North Carolina avenue, east; New York avenue, between Seventeenth and Eighteenth streets, north; corner Eighth and E streets, southwest.

REPORT OF THE SURVEYOR, DISTRICT OF COLUMBIA.

SURVEYOR'S OFFICE, DISTRICT OF COLUMBIA,
Washington, October 18, 1890.

SIR: I have the honor to transmit herewith a report of the transactions of the office during the year ending June 30, 1890.

During that period 316 orders for surveys were received, and 194 subdivisions recorded, and services as follows rendered the District of Columbia, per orders of honorable Commissioners:

Surveys of lots, streets, and alleys, 10.

Recorded plat of dedication of Pennsylvania avenue extended from Twining City to Bowen Road.

Investigation and report upon streets, alleys, and miscellaneous subjects referred to the surveyor, 46.

Maps, plats, and tracings, 14.

Survey of Naylor Road from River Road to Good Hope Road.

Survey and levels, Harewood Road through lands of Conway Robinson, deceased, attorney, District of Columbia.

I again respectfully renew my recommendation of last year for an appropriation to purchase the original records of this office. They are being defaced and disintegrated by constant handling, small particles here and there missing, and can only be preserved by making up copies carefully compared and attested by the surveyor, the originals used in case of litigation.

Plats of all current subdivisions, city, county, and Georgetown, are made and areas computed for information and guidance of the assessor's and water offices, and other information furnished them and the engineer's office as called for.

Very respectfully, your obedient servant,

WM. FORSYTH,
Surveyor, District of Columbia.

RECEIVED BY THE COMMISSIONERS OF THE DISTRICT OF COLUMBIA.

REPORT OF PROPERTY CLERK.

WASHINGTON, D. C., December 27, 1890.

SIR: I have the honor to submit to you a brief synopsis of the operations of the office of the property clerk during the fiscal year ending June 30, 1890.

The year which has just passed has been a laborious one to this office, notwithstanding that it has been relieved of the care of the property yards and material. My duty is to purchase all supplies for the District Government, upon requisitions received by the District Commissioners. The appropriations being increased from year to year, causes an increased amount of labor in this office. The number of requisitions made during the year was 2,700. The number of orders given upon these requisitions was 6,340, and the number of bills rendered was 4,530. All bills for supplies are examined, briefed, and approved in my office and then forwarded to the auditor for payment.

In making purchases for general supplies, such as stationery, blanks, school books, I annually prepare schedules and advertise for proposals for the supplies. The system is a good one, as there is so much competition that we get proposals for furnishing goods far below the prices paid by private citizens. (See below schedule of prices.) There are a great many items that can not be anticipated, and such supplies are purchased in open market through competition or bids.

The system of awarding contracts for supplies by the item to the lowest bidder results in a saving to the District, but it increases the labors of this office 100 per cent. I have but two employes to assist me in my duties. I greatly need the labors of one more to facilitate and systematize the work of the office. In this connection I wish to draw your attention to small salaries the employes of my office receive—one clerk, at \$1,200 per annum, and the other at \$720 per annum. I earnestly desire that their salaries may be increased to \$1,200 and \$1,000 per annum.

Very respectfully,

F. O. BECKETT,
Property Clerk.

M. T. ROSSELL,
Captain Engineers, U. S. A.

CLASS I.—Stationery.

Books, memorandum:

Sheep, indexed, $\frac{1}{4}$ by $\frac{3}{4}$, 100 leaves,	
per dozen	\$1.85
Sheep, indexed, $\frac{1}{4}$ by $\frac{7}{8}$, 100 leaves,	
per dozen	1.90
$\frac{1}{4}$ by $\frac{7}{8}$, 50 leaves, sheep, indexed,	
per dozen	1.50
$\frac{1}{4}$ by $\frac{7}{8}$, 100 leaves, sheep, plain, per	
dozen	1.60
$\frac{1}{4}$ by $\frac{7}{8}$, 50 leaves, sheep, plain, per	
dozen	1.00

Books, letters received, demy, real Russia ends and bands, full sheep, per sample:

600 pages	each	8.00
900 pages	do	10.00
800 pages	do	9.50

Books, time, $\frac{7}{8}$ by $\frac{1}{2}$, full sheep, monthly, per dozen

		1.60
--	--	------

Books, letter copy:

500 pages, letter size, full sheep, per		
sample	each	1.00
700 pages, cap size, full sheep, per		
sample	each	1.50
1,000 pages, cap size, full sheep, per		
sample	each	2.00

Books, scratch:

No. 4028	per dozen	.50
No. 4030	do	.75
All sizes not mentioned above	do	.70

Bells:

Call, No. 3200 (Bradley & Hubbard's),		
each		.75
Hand, No. 6, heavy (Barton's), per		
dozen		4.50
Hand, large, No. 8	per dozen	5.50

Baskets, office:

Large, telegram No. 20-3	do	4.28
Small, telegram No. 20-3	do	3.27

Blotters, Moore's, polished rosewood, per dozen

		4.50
--	--	------

Bands, rubber, Faber's pure:

Nos. 12 to 16, thread	per gross	.11
Nos. 30 to 33, $\frac{1}{8}$ -inch	do	.96
Nos. 000 and 000, $\frac{1}{8}$ -inch	do	.62
Nos. 00 and 000, $\frac{1}{8}$ -inch	do	.99
No. 000, heavy, $\frac{1}{8}$ -inch	do	1.42

Chalk:

White	per pound	.06
Red	do	.10

Crayon, chalk, equal to New York Crayon Co.'s

	per gross	.05 $\frac{2}{3}$
--	-----------	-------------------

Envelopes, white:

No. 4, XXX	per M.	1.38
No. 5, XXX	do	1.35
No. 6, XXX	do	1.50
No. 9, XXX	do	2.68
No. 10, XXX	do	2.75
No. 11, XXX	do	2.75

Envelopes, Irish linen, note size

	do	4.00
--	----	------

Erasers:

Steel, best knife blade, Rodger's bone		
handle	per dozen	3.91
Ink and pencil, Faber's mammoth,		
per dozen		1.49
Ink and paper cleaners, Faber's im-		
proved	per dozen	.32

Files, Shipman's:

10 by 12, 250 leaves	each	.57
9 by 15, 500 leaves	do	.97
9 by 13, 250 leaves	do	.58

File-holders, Woodruff's:

Poplar, 9 by $9\frac{1}{4}$ inches	per dozen	4.50
Black walnut, 9 by $9\frac{1}{4}$ inches	do	5.70

Hones, office, Scotch, 5-inch, in boxwood cases, genuine

	per dozen	6.50
--	-----------	------

Ink, Faber's, violet black, copying, superior

	per quart	.40
--	-----------	-----

Ink, Underwood's:

Everlasting bank fluid	do	.30
Combined writing and copying, Co-		
balt	per quart	.52
Egyptian black fluid	do	.38
Cobalt extra copying	do	.70
Egyptian black combined writing		
and copying	per quart	.55
Carmine	do	1.20

Ink, Carter's:

Copying and writing combined	do	
"Black"	do	
Raven Black	do	

Ink, Arnold's fluid, genuine

	per pint	
--	----------	--

Ink, Thomas's black, glass bottles, per quart

	do	
--	----	--

Ink, David's:

Carmine, No. 4, glass stoppers, per		
dozen		

Blue

	per pint	
--	----------	--

Ink, Stafford's:

Fluid commercial	per quart	
------------------	-----------	--

Copying, machine

	do	
--	----	--

Blue black, office

	do	
--	----	--

Universal

	do	
--	----	--

Ink, crimson, Stafford's

	do	
--	----	--

Ink, Barnes's:

Jet black national	do	
--------------------	----	--

National writing fluid

	do	
--	----	--

National copying

	do	
--	----	--

Writing and copying

	do	
--	----	--

National carmine

	do	
--	----	--

Ink:

Cochrane's red	per pint	
----------------	----------	--

Papyrographic

	per bottle	
--	------------	--

Hektograph

	do	
--	----	--

Color Papyrographic

	do	
--	----	--

India, liquid, Windsor and Newton's,

per bottle		
------------	--	--

Inkstands, bankers':

No. 50	per dozen	
--------	-----------	--

Double, No. 1

	do	
--	----	--

Single, No. 1

	do	
--	----	--

No. 60

	do	
--	----	--

Inkstands, glass stoppers, No. 308, $\frac{1}{2}$ -

inch	per dozen	
------	-----------	--

Ink vents, perfection bottle stopper, per

dozen		
-------	--	--

Ink wells, metallic, glass lined, Whit-

comb's	per dozen	
--------	-----------	--

Ink wells, novelty

	do	
--	----	--

Ink extractors, Bloede's

	do	
--	----	--

Ink well, Dulany's

	do	
--	----	--

Mucilage:

Best, equal to Barnes's	per quart	
-------------------------	-----------	--

Founts, Morgan's, No. 2

	per dozen	
--	-----------	--

Founts, Morgan's, No. 6

	do	
--	----	--

Founts, Wolf's, nickel plated

	do	
--	----	--

McGill's fasteners:

$\frac{1}{2}$ -inch (100 in box), flat head, No. 1,		
---	--	--

per box

$\frac{1}{2}$ -inch (100 in box), flat head, No. 2,		
---	--	--

per box

$\frac{3}{8}$ -inch (100 in box), flat head, No. 3,		
---	--	--

per box

1-inch (100 in box), flat head, No. 4,		
--	--	--

per box

Single, staple (250 in box)	per box	
-----------------------------	---------	--

Paper, equal to Whiting Paper Co.'s:

Legal cap, 14 pounds, ruled, per		
ream		

Foolscap, 14 pounds

	per ream	
--	----------	--

Letter, 12 pounds

	do	
--	----	--

Letter, 14 pounds

	per ream	
--	----------	--

Note, 6 pounds

	do	
--	----	--

Note, 7 pounds

	do	
--	----	--

Paper, typewriter:

Cap size, equal to Regent No. 4, W. S.		
--	--	--

& B.

	per ream of 500 sheets	
--	------------------------	--

Letter size, equal to Regent No. 4, W.

S. & B.	per ream of 500 sheets	
---------	------------------------	--

Cap size, equal to Paragon, 14, wove.

W. S. & B.	per ream of 500 sheets	
------------	------------------------	--

Letter size, equal to Paragon, 14, wove.

W. S. & B.	per ream of 500 sheets	
------------	------------------------	--

Paper:

Note, Irish linen, best	per ream	
-------------------------	----------	--

Examination

	do	
--	----	--

Drawing (Whitman's double ele-

phant, 27 by 40)	per sheet	
------------------	-----------	--

Blotting, Treasury blotter, No. 100, 90

pounds to ream	per ream	
----------------	----------	--

Carbon, cap size

	per quire	
--	-----------	--

Wrapping, manilla, assorted sizes

	per pound	
--	-----------	--

CLASS I.—Stationery—continued.

continued:			
manilla tissue (cap size), per			
sheet..... per sheet.....	\$0.13½		
graph, cap, in blocks..... each.....	.05½		
graph, note, in blocks..... do.....	.75		
.....	.25		
rian, No. 1..... per gross.....	.75		
..... No. 303..... do.....	.75		
..... No. 404..... do.....	.41		
..... engrossing, No. 3..... do.....	.65		
rooks, No. 128 (school pen.) per			
do.....	.38		
rooks, assorted..... per gross.....	.45		
..... National, No. 1..... do.....	.35		
..... National, No. 248..... do.....	.35		
..... Golden Falcon..... do.....	1.20		
laucous (all kinds not enumer-			
ated)..... per gross.....	.75		
..... do.....	2.50		
Bros., University, No. 28..... do.....	.40		
Bros., No. 444..... do.....	.33		
..... Alteneder's, any size, per			
do.....	12.00		
..... Gishburn's..... per set.....	.20		
.....			
No. 2240, Faber's..... per gross.....	.68		
..... Nos. 1537, 1538, 1539, Faber's,			
ross.....	2.85		
..... any size..... per dozen.....	.95		
..... Pencil Co., crown, No. 1, per			
do.....	.30		
..... Pencil Co., crown, No. 2, per			
do.....	.32		
..... Pencil Co., crown, No. 3, per			
do.....	.37		
..... Pencil Co., crown, No. 4, per			
do.....	.40		
..... No. 1407..... per gross.....	.69		
..... 2411, 3411, 4411..... do.....	1.57		
..... 2712, 3712, 4712..... do.....	1.57		
..... 2331, 3331, 4331..... do.....	2.76		
..... No. 2722, pen ejecting..... do.....	2.50		
Faber's, hexagon, best, Nos. 1,			
2, 3..... per gross.....	5.90		
Faber's, round, best, Nos. 1, 2, 3,			
4..... per gross.....	4.00		
Faber's, hexagon, artists', 2-H,			
4-H, 5-H, and 6-H, Siberian,			
ross.....	9.00		
..... combined carmine and blue,			
9-inch..... per dozen.....	.75		
..... American Graphite, S., SM.,			
and V.H..... per gross.....	3.57		
..... Dixon's American Graphite,			
ted..... per gross.....	7.45		
..... hexagon, gold, 1, 1½, 2, 2½, 3, 4, 5			
ross.....	3.99		
..... round, gold, 1, 1½, 2, 2½, 3, 4, 5,			
ross.....	2.99		
..... fine arts, 6 B. to 6 H., per			
do.....	7.99		
..... colored crayons, any color, per			
do.....	.45		
..... hexagon office, No. 402, per			
do.....	.50		
..... automatic, red, green, black,			
copying ink, size A, per dozen.....	1.60		
..... compass, No. 553..... do.....	.75		
Pencil leads:			
For automatic pencils, indelible, per			
dozen.....	\$0.40		
For automatic pencils, colored, per			
dozen.....	.20		
Pins, toilet, in pyramids of 360 pins, per			
paper.....	.05½		
Paper cutters, 10-inch, Congress, per			
dozen.....	5.00		
Paste, parlor, equal to Schorville Mann-			
facturing Company..... per quart.....	.50		
Pointers, black-board, 4, 5 and 6 feet, each			
Pencils, carpenters'.....	.12		
..... Eagle, 435..... per dozen.....	.14		
..... Eagle, 462..... do.....	.22		
Rulers:			
Boxwood, brass edge, 24-inch and under,			
Faber's, 112..... per dozen.....	3.00		
Gutta purcha, flat, 24-inch and under,			
per dozen.....	3.00		
Rubbers:			
Eagle, pencil and ink eraser, medium,			
per dozen.....	.98		
Black-board, Novelty crayon eraser,			
per dozen.....	.60		
And bevel eraser, Eagle Pencil Com-			
pany, any size..... per dozen.....	.30		
Diamond ink eraser, Eagle Pencil			
Company (80's)..... per dozen.....	.24		
Diamond, any size..... do.....	.33		
Shears, 10-inch, Seymour bankers', each.....	.58½		
Sponge for caps, best..... per pound.....	.85		
Sponge cups, bankers', 3-inch, heavy, per			
dozen.....	.60		
Scale, triangular, boxwood, 10ths and			
inches, each.....	1.10		
Twine:			
Linen..... per pound.....	.40		
Hemp..... do.....	.15		
Elm and flax..... do.....	.20		
Thermometer, 7-inch, japanned, tin frame			
each.....	.07		
Tape, red, No. 21, 72 yards to spool, per			
spool.....	.18		
Triangles, rubber, all sizes..... per dozen.....	.25		
Tablets:			
Memorandum, note size..... do.....	.50		
Memorandum, assorted sizes..... do.....	.60		
Sand paper, 2½ by 4 inches..... do.....	.75		
Letter size, ruled to order..... do.....	1.50		
Tacks, thumb, German silver, any size,			
per dozen.....	.20		
Tape lines, Chesterman's best:			
100 feet, metallic..... each.....	3.00		
50 feet, metallic..... do.....	1.93		
100 feet, steel..... do.....	8.00		
50 feet, steel..... do.....	5.00		
Tracing cloth, imperial, or equal to:			
36-inch..... per roll.....	5.47		
42-inch..... do.....	7.40		
Wax, sealing..... per pound.....	.25		
Pens, American States Pen Co.'s:			
No. 1848, Falcon..... per gross.....	.36		
No. 27, Chase's legal..... do.....	.60		
No. X292X, public schools..... do.....	.36		
No. 3X3, academic..... do.....	.60		
No. 4X4, university..... do.....	.33		
No. 144, tar State..... do.....	.60		
No. 1900, Gold-plated falcon..... do.....	1.20		
Erasers, rubber, American States Pen			
Co.'s, electric, No. 40..... per dozen.....	.30		

CLASS II.—Blank forms and printing.

[Proof sheets will be required in every case before blanks will be accepted.]

cards..... per M.....	\$1.00	Forms, blank, flat letter, four to the sheet,	
ink, flat letter, full sheet, ruled		ruled and printed on one or both sides:	
ed on one or both sides.....		12-pound paper..... per M.....	\$1.25
ed paper..... per M.....	5.00	14-pound paper..... do.....	1.45
ed paper..... do.....	6.00	Forms, blank, cap:	
ink, flat letter, two to the sheet,		Full sheet, ruled and printed on one or	
printed on one or both sides:		both sides, 16-pound paper..... per M.....	7.50
ed paper..... per M.....	2.87	Two to the sheet, ruled and printed on	
ed paper..... do.....	3.25	one or both sides, 16-pound paper,	
		per M.....	4.50

CLASS II. *Blank forms and printing*—Continued.

Forms, blank, cap—Continued.

Two to the sheet, ruled and printed on one or both sides, linen ledger, 18-pound paper	per M..	\$7.00
Four to the sheet, ruled and printed on one or both sides, 16-pound paper, per M		2.53
Forms, blank, demy:		
Full sheet, ruled and printed on one or both sides, 28-pound paper	per M..	12.50
Four to the sheet, ruled and printed on one or both sides, linen ledger, 28-pound paper	per M..	6.50
Forms, blank, folio post:		
Full sheet, ruled and printed on one or both sides, 28-pound paper	per M..	14.48
Two to the sheet, ruled and printed on one or both sides, 28-pound paper, per M		5.34
Four to the sheet, ruled and printed on one or both sides, 28-pound paper, per M		3.12
Forms, blank, medium, full sheet, ruled and printed on one or both sides, 36-pound paper	per M..	20.00

Forms, blank, royal:

Full sheet, ruled and printed on one or both sides, 45-pound paper	per M..	\$2
Half sheet, ruled and printed on one or both sides, 45-pound paper	per M..	11
Printing official letter-heads, half sheet, per ream		
Printing official envelopes	per M..	
Printing, miscellaneous:		
Pica	per M ems..	
Small pica	do ..	
Long primer	do ..	
Brevier	do ..	
Nonpareil	do ..	

NOTE.—All blanks must be ruled and printed in one or more colors as required. Miscellaneous printing must be upon 50-pound No. 1 book paper of the best quality, in not less than fifty copies, and will include all briefs, records, tax-list and annual reports under the District government.

CLASS III.—*School books.*

Algebra, Wentworth's Elements of, abridged, per dozen	\$11.00
Analysis, Word, Swinton's (old edition), per dozen	3.00
Arithmetic:	
Picklin's (Elementary)	per dozen.. 4.15
Picklin's National	do .. 7.28
Davies Intellectual	do .. 2.60
Bible, 12mo, roan (brevier)	do .. 6.00
Books, Spencer's new copy, Nos. 1, 2, 3, 4, 5, 6	per dozen.. .83
Books, drawing:	
Smith's Manual of Free-hand, Primary schools, Clarke edition, per dozen	6.00
Smith's Manual, Part 1 and Part 2, Clarke edition	per dozen.. 5.20
Smith's, No. 1 to 6, revised edition (small), Clarke edition, per dozen ..	.86
Smith's No. 6 to 13, revised edition (large), Clarke edition, per dozen ..	1.72
Child's Health Primer, A. S. Barnes & Co	per dozen.. 3.13
Dictionary:	
Academic, Worcester's	per dozen.. 15.00
Worcester's Unabridged (new), sheep, each	6.50
Webster's Unabridged (new, with index), sheep, each	8.70
Munroe's Physical and Vocal Training, per dozen	7.54
Geography:	
Swinton's Introductory	per dozen.. 5.75
Swinton's Grammar School, per dozen ..	13.10
Globes, 6-inch, terrestrial, Steiger's, plain on bronze stand, No. 7 C	each.. .90
Grammar:	
Kerl's Common School	per dozen.. 7.50
Latin, Allen and Greenough	do .. 11.25

History:

Egleston's United States	per dozen..
Thompson's English	do ..
Lossing's Encyclopedia United States, per dozen	

Hygiene:

Steele's Physiology	per dozen..
for Young People	do ..
Lessons, Language, Kerl's	do ..
Maps, Olmsted's patent spring, wood case, each	

Lessons:

Calkin's Primary Manual of Object, per dozen	
Leighton's Latin	per dozen..
Physics, Gage's Elements of	each..

Readers:

Primer, and first Franklin (new), per dozen	
Second Franklin (new)	per dozen..
Third Franklin (new)	do ..
Fourth Franklin (new)	do ..
Intermediate Franklin	do ..
Fifth Franklin (new)	do ..
Mason's Music, first (new)	do ..
Mason's Music, second (new)	do ..
Mason's Music, third (new)	do ..
Mason's Abridged Music, fourth, revised edition	per dozen..
Mason's Music, Intermediate, per dozen	
Mason's Music, Abridged Independent	per dozen..
Geographical, Scribner's	per dozen..
Record, Tracey's School	do ..
Spellers, Pronouncing, Worcester's New, per dozen	
Pronouncing Gazetteer, Lippincott's, each ..	

CLASS IV.—*Furniture.*

[NOTE.—The price for carpeting and matting must include making and laying.]

Bookcase, Danner's revolving:	
No. 2, standard, 40 inches high	each.. \$12.00
No. 3, standard	do .. 14.25
No. 4, standard	do .. 15.85
Carpets, body Brussels, American, five frame, as per samples submitted, per yard	1.07 1/2
Carpet-lining paper, best quality, 5 rows stitched	per yard.. .04
Chair bottoms, all sizes, perforated, per dozen	1.74
Chairs, common, wood, bent tops, per dozen	4.70

Chairs, oak:

Perforated seat, bent top, 486, P. Haywood Bros. & Co	per dozen..
Arm, cane-seated (rodded) Douglass ..	per dozen..
Arm, wood seat (rodded) Douglass ..	per dozen..

Chairs, black walnut:

Arm, cane-seated office (rodded) Douglass ..	per dozen..
Arm, cane-seated office (rodded) Continental ..	per dozen..

CLASS IV.—Furniture—Continued.

Black walnut—Continued.		
seated, high back, arm, revolv-		
ing, tipping, Harmony .. per dozen..	\$124.00	
te. S. & S. per dozen..	143.95	
American bent, No. 453, Haywood		
& Co. per dozen..	19.85	
Ostrich feather:		
center, No. 7 .. per dozen..	1.99	
ten-inch, full center .. do ..	11.00	
teen-inch, full center .. do ..	14.00	
American, all widths (or opaque),		
square yard ..	.17	
Scotch, all widths, per square		
yd ..	.24	
do (best quality), per square		
yd ..	.68	
es, hair, made up, best quality		
(American hair) .. per pound..	.37	
do, best quality, white, per square		
yd ..	.59	
er, best quality, per square		
yd ..	.55	
do, best quality, white, as per		
sample submitted, per square		
yd ..	.35	
do, fancy, as per sample submitted,		
square yard ..	.35	
Mats, cocoa, office, plain, best quality,		
per square foot ..	\$0.29	
Oilcloth, best quality, two yards wide		
and under .. per square yard..	.54	
Pillows, feather, made up (cold blast), per		
pound ..	.48	
Pitchers, half gallon, English granite,		
best half-boy jug, No. 12 .. each..	.25	
Spittoons, cuspidor:		
Iron, porcelain lined, per sample, per		
dozen ..	6.00	
Nickel-plated, loaded bottom, per		
sample .. per dozen..	10.80	
Tumblers, glass, per sample .. do ..	.48	
Water-cooler, walnut:		
Three gallons .. each..	3.40	
Four gallons .. do ..	4.80	
Six gallons .. do ..	6.00	
Eight gallons .. do ..	7.35	
Stands, with drip pan and 4-inch post,		
each ..	1.70	
Window shades, making and hanging		
only .. per shade..	.16½	
Window rollers, 1 and 1½ inch, Hartshorn		
(all lengths):		
Tin barrel .. per dozen..	5.24	
Wood barrel .. do ..	2.48	

CLASS V.—Hardware.

ing, assorted .. per dozen..	\$0.03	
ing, assorted .. do ..	.03	
dies (peg, brad; sewing), assorted,		
ten ..	.10	
do, all sizes, equal to Mann's, each		
case:	.49	
ond X .. per dozen..	.50	
do .. do ..	.06	
or, assorted sizes, ¼ to 1½ inch, Jen-		
double spur .. each..	.13	
Army and Navy, No. 4, per dozen.	.37	
Mason's, No. 4 .. do ..	.40	
Royal dauber .. do ..	1.65	
3-hoop, iron bale .. do ..	3.97	
er, cedar, 3 galvanized hoops, per		
dozen ..	2.99	
heavy 5-string, as per sample (30		
unds to dozen) .. per dozen..	2.69	
do, per sample, 3-string, Standard		
K .. per dozen..	1.34	
do, 14-inch, heavy, per sample,		
h handles .. per dozen..	3.50	
do, 16-inch, heavy, 6-row, per sam-		
ple .. per dozen..	4.69	
do, 16-inch, heavy, with handles,		
re drawn .. per dozen..	5.24	
ewash, 12 knots, 0000, special, all		
steel, Russian okatka, per sample,		
dozen ..	7.20	
ewash, per sample, No. 30 extra		
Russia bristles .. per dozen..	10.70	
polishing, per sample .. do ..	2.20	
ing, per sample, No. 6, all white,		
dozen ..	4.59	
ping, 14-inch, XX, 6-foot handle,		
sample .. per dozen..	9.37	
ping, 18-inch, XX, 6-foot handle,		
sample .. per dozen..	11.37	
do, all bristle, No 52 .. per dozen..	1.67	
do, 2-inch and under, all kinds, per		
dozen ..	.30	
ight iron (square or round),		
1-inch and under .. per dozen..	.60	
ight iron (square or round), 6 and		
1-inch .. per dozen..	1.30	
ight iron (square or round), 10		
2-inch .. per dozen..	1.95	
age, 5-inch and under .. per 100..	.60	
Brads:		
1 to 3 inch, wire .. per pound..	\$0.04½	
3-inch and under, wire .. do ..	.06	
Babbitt metal, No. 2 .. do ..	.09	
Cloth, crocus .. per sheet..	.02	
Cord, sash:		
Hemp, Russia .. per pound..	.14	
Braided (Silver Lake) .. do ..	.27	
Emery cloth, all numbers .. per quire..	.48	
Eagle tripoli .. per dozen papers..	.50	
Files, flat, 4, 6, 8, 10, 12, 14, and 16 inch:		
Bastard .. per dozen..	1.06	
Smooth .. do ..	2.61	
Files:		
Saw, all sizes, 3-cornered .. do ..	.44	
Round, 5, 6, 8, 10, and 12 inch, bastard		
and smooth .. per dozen..	.94	
Square, 5, 6, 8, 10, and 12 inch, bastard		
and smooth .. per dozen..	1.24	
Halfround, 4, 6, 8, 10, 12, 14, and 16 inch		
bastard and smooth .. per dozen..	2.24	
Forks:		
Hay, best 3-prong with long handle,		
Keystone or equal to .. per dozen..	3.20	
Mannre, 4-prong, long and D handle,		
Keystone or equal to .. per dozen..	3.20	
Fuse, powder:		
Double waterproof .. per foot..	.00½	
Cotton .. do ..	.00½	
Felt roofing, tarred .. per pound..	.02½	
Handles:		
Sledge, No. 1 .. per dozen..	.84	
axes, No. 1 .. per dozen..	.84	
pick, No. 1 .. do ..	.84	
Hasps and staples, 10-inch and under, per		
dozen ..	.24	
Hasps, hinged, 10-inch and under, per		
dozen ..	.48	
Hatchets:		
shingling, Nos. 2 and 3, Peck's, or		
equal to .. per dozen..	4.11	
half, Nos. 2 and 3, Peck's, or equal to,		
per dozen ..	4.47	
Hinges:		
strap, 6-inch and under, light, per		
pair ..	.03	
strap, 8 to 12-inch, inclusive, light,		
per pair ..	.08½	
strap, 6 to 14-inch, inclusive, heavy,		
per pair ..	.14	
strap, 6 to 16-inch, inclusive, extra		
heavy, per pound ..	.02½	
blind, No. 0 to 3-inch, heavy, Lull &		
Porter, per pair ..	.08	

CLASS V.—Hardware.

Hinges:

inside shutter, back flaps (all sizes), per pair	40.01
butt, fast and loose, 5 by 5-inch and under, per pair	.05
inside blind (butts), any size, per pair	.01
T, 6-inch and under, light, per pair	.03
T, 6 to 12-inch, inclusive, heavy, per pair	.07
T, 8 to 12-inch, inclusive, light, per pair	.07
T, 14 and 16-inch, heavy, per pair	.15
brass (butt), 3 by 2-inch and under, fast and loose, per pair	.08
Hooks and eyes, brass, 5-inch and under, per dozen	.36
Horseshoe rasps, 14 to 16-inch, Heller's, or equal to, per dozen	5.12
Hooks and staples, wrought iron, 8-inch and under, per dozen	.24
Hooks and hinges, screw and drive, assorted sizes, per pound	.03½
Hammers:	
clay, adze eye, all steel, each	.29
stone, all steel, Napping hammer, per pound	.08
sledge, all steel, per pound	.09
Hoes, steel, best:	
solid socket, garden, each	.22
for street use, Harper's or equal to, each	.35
mortar, Harper's, or equal to, each	.45

Iron:

bar, American, all sizes, refined, flat or square, per pound	.02
round, American, 1½-inch and under, refined, per pound	.02
Norway, round, flat, or square, per pound	.04
Knobs, door (bronze iron), per pair	.24
Keys, blank, brass, per dozen	.36
Knives, pole, pruning, per sample (Waters'), each	1.25
Locks:	
pad, No. 20, M. W. & Co.'s (two keys to lock), per dozen	2.49
jail, latest improved Scandinavian (star), per dozen	2.38
pad, No. 1033, M. W. & Co.'s (two keys to lock), per dozen	2.40
two keys, rim, 4-inch, brass bolts and keys, per dozen	2.50
two keys, rim, 5-inch, brass bolts and keys, per dozen	3.39
two keys, mortice, 5-inch, brass front, bolts and keys, per dozen	4.00
one key, cottage rim, per dozen	1.75

Latches:

thumb, per dozen	.35
night, two keys, Yale, do	14.50
Ladders, step, Adams', or equal to, per foot	.15
Mattocks, including handle, long cutter, Iron City, or equal to, per dozen	6.89
Mops, floor, cotton, 17 pounds, per dozen	1.90
Mop and brush handles, do	.95

Nails:

horseshoe (best), Putnam, or equal to, per pound	.14
hinge, wrought, pump, per pound	.09
Clout, in one-pound papers, 1-inch to 2-inch, per paper	.06
Cut, finishing, 6 to 10-penny, per pound	.02½
Cut, 3-penny, per pound	.02½
Cut, 4 and 5-penny, do	.02½
Cut, 6 and 7-penny, do	.02½
Cut, 8 and 9-penny, do	.02½

Nails:

Cut, 10 to 60-penny, per pound	.02½
Wrought, all sizes, do	.02
Steel wire, 3-penny, do	.04
Steel wire, 4 and 5-penny, do	.03
Steel wire, 6 and 7-penny, do	.03½
Steel wire, 8 and 9-penny, do	.04
Steel wire, 10 to 60-penny, do	.02½
Paper, sand, per quire	.13
Pegs, shoe, per quart	.30
Picks, adz eye, 6 to 9 pounds, including handles, Iron City Tool Works, Pittsburgh, Pa., per dozen	5.80
Powder, blasting, per pound	.09
Pruning blades (Waters'), each	.29
Rope:	
All sizes, pure manila, per pound	.14
Cotton, all sizes, "A" quality, per pound	.18
Rakes:	
Steel, 14 teeth, per dozen	3.50
Malleable iron, 14 teeth, do	1.80
stone, per sample, round teeth, do	3.00
Wrought iron, concrete rake, long shank, per dozen	3.95
Rivets and burrs, copper, all sizes, per pound	.24
Rule, brass bound, carpenter's 2 foot, each	.12
Scoops, large, coal, cast steel, all sizes, Remington, or equal to, per dozen	11.28
Spikes, 4 to 6-inch, cut, per pound	.02½
Scythes:	
American, each	.33
English (Waldron's), do	.92
Scythe stones, genuine, English, do	.95
Shovels:	
Best, D-handle (Ames'), per dozen	8.17
D-handle (Hussey, Binns & Co., Pittsburgh, Pa.), per dozen	7.95
Long-handled, round points (Ames'), per dozen	8.35
Long-handled, round or square points (Hussey, Binns & Co., Pittsburgh, Pa.), per dozen	7.95
Spades, (Ames'), do	8.84
Saws:	
Hand (Diston's) cross cut or rip, each	1.19
Buck (Diston's), do	.49
Compass (Diston's), do	.17
Slating, silicate, black diamond, per gallon	3.75
Shoes, horse, Perkins' or equal to, per pound	.03½
Screw-driver, 12-inch and under, each	.10
Screws, 2-inch and under, per gross	.21
Twine, Mason's, per pound	.25
Tacks:	
6, 8 and 10-ounce papers, full weight, per paper	.91
12, 14, 16 and 18-ounce papers, full weight, per paper	.90
Turnbuckles, cast-iron, Japanned:	
For wood, per dozen	.10
For brick, do	.13
Washboards, double zinc, do	1.92
Wheelbarrows:	
Steel (Jackson), Nos. 2 to 5, each	6.24
Wood, with sides, garden, Nos. 2 to 4, each	2.60
Wrench, monkey, Coe's knife-handle:	
6-inch and under, each	.24
8-inch, do	.29
10-inch, do	.37
12-inch, do	.39
14-inch, do	.46
18-inch, do	1.00
Wire, copper, all sizes, per pound	.22

CLASS VI.—*Tinware.*

Nos. 1 and 2.... per hundred..	\$1.50	Fire clay, Nos. 1 and 2..... per barrel..	\$5.00
en, 14 quart with lip covered,		Lanterns:	
zen	4.00	Tubular, No. 0 Dietz..... each ..	.65
p jar, painted	4.00	Tubular, No. 0 Dietz, red globes.. do...	1.10
zed iron, 10-quart..... do	2.82	Railroad..... do.....	1.00
sh, 12-inch, stamped tin, re-		Railroad, red globes..... do.....	1.10
5, with foot..... per dozen..	1.00	Plates, tin..... per dozen..	.25
d tin, retinned, 010, 4½-inch, per		Pipe, stove, American iron, all sizes, per	
d iron, quarts, tinned, No. 100,	.45	pound.....	.04
zen.....	2.50	Pans, dust, corrugated, painted, ¼ cov-	
cells, per sample per dozen..	.50	ered..... per dozen..	1.25
galvanized iron, 18-inch, open,		Polish, stove:	
sling, tin, green:	.33	Sticks, Dixon's square..... do.....	.50
each.....	.86	Dixon's..... per pound..	.10
do.....	.90	Pokers, 20 and 24-inch..... per dozen..	.75
do.....	.44	Shovels, stove:	
quarts stamped per dozen..	.49	Short-handled..... do.....	.75
merican iron, all sizes... each..	.10	Long-handled..... do.....	1.00
		Tin, roofing, I. C. 14 by 20..... per box..	6.00
		Wire, stove..... per pound..	.08
		Zinc, sheet..... do.....	.06

CLASS VII.—*Plumbers' material.*

and under (pure gum), per		Tees, reducing:	
l.....	\$0.35	¾-inch..... each..	\$0.01½
and under (cloth inserted).		¾-inch..... do.....	.02½
oun 1.....	.14	¾-inch..... do.....	.03½
¾-inch 4 ply (branded stand-		1-inch..... do.....	.04½
e..... per foot..	.07½	1½-inch..... do.....	.08
alves..... each.....	.07½	1½-inch..... do.....	.10½
andle sockets..... do.....	.99	2-inch..... do.....	.17
andle guides..... do.....	.14	Bushings:	
ps..... do.....	.13	¾-inch..... do.....	.01
andles..... do.....	.20	¾-inch..... do.....	.01
urnals, cast iron..... do.....	.20	¾-inch..... do.....	.01½
mhaha and Grant, or equal to,	.05	1-inch..... do.....	.01½
ounds.....	.47	1½-inch..... do.....	.02½
..... per pound..	.42	1½-inch..... do.....	.03½
brass, male or female (solder-	.06½	2-inch..... do.....	.05½
as):		Plugs:	
..... each.....	.06	¾-inch..... do.....	.00½
..... do.....	.07	¾-inch..... do.....	.00½
..... do.....	.10	¾-inch..... do.....	.01
..... do.....	.14	¾-inch..... do.....	.01
..... do.....	.18	1-inch..... do.....	.01½
..... do.....	.30	1-inch..... do.....	.02
..... do.....	.30	1½-inch..... do.....	.02½
vanized iron, ¾-inch, keystone,	.20	2-inch..... do.....	.04
o.....	.03	Nipples, close:	
vanized iron, ¾-inch, keystone,		¾-inch..... do.....	.01
o.....	.01	¾-inch..... do.....	.01
..... each.....	.01	¾-inch..... do.....	.01½
..... do.....	.01½	1-inch..... do.....	.02
..... do.....	.02	1-inch..... do.....	.02½
..... do.....	.03	1½-inch..... do.....	.02½
..... do.....	.04½	1½-inch..... do.....	.03½
..... do.....	.06	2-inch..... do.....	.05
..... do.....	.10	Nipples, long:	
lucing:		¾-inch..... do.....	.01½
do.....	.01½	¾-inch..... do.....	.01½
do.....	.01½	¾-inch..... do.....	.02
do.....	.01½	¾-inch..... do.....	.02½
do.....	.03	1-inch..... do.....	.08
do.....	.04	1½-inch..... do.....	.04
do.....	.05½	1½-inch..... do.....	.05
do.....	.07	2-inch..... do.....	.07
do.....	.10	Return bends:	
do.....	.01	¾-inch..... do.....	.03½
do.....	.01½	1-inch..... do.....	.06
do.....	.02	1½-inch..... do.....	.09
do.....	.03	1½-inch..... do.....	.12
do.....	.05	2-inch..... do.....	.18
do.....	.07	Malleable iron fittings:	
do.....	.14	galvanized..... per pound..	.12
do.....		black..... do.....	.08
do.....		Long screws, black:	
do.....		¾-inch..... each..	.10
do.....		¾-inch..... do.....	.14
do.....		1-inch..... do.....	.19
do.....		1½-inch..... do.....	.25
do.....		1½-inch..... do.....	.33
do.....		2-inch..... do.....	.43

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CLASS VII.—Plumbers' material—Continued.

Long screws, galvanized:				Male and female spear-head coupling	
1-inch.....	do.....	\$0.12		irons.....	each..
2-inch.....	do.....	.18		Wood pump rods.....	do.....
1-inch.....	do.....	.22		Wood chamber plugs.....	do.....
1 1/2-inch.....	do.....	.30		Solder, w/pping, extra.....	per pound..
1 1/2-inch.....	do.....	.40		Tongs, extension, Brown's:	
2-inch.....	do.....	.50		No. 1 1/2.....	per pair..
Packing:				No. 3.....	do.....
tucks, all sizes.....	per pound..	.33		No. 5.....	do.....
asbestos, wick.....	do.....	.20		Valves, brass, globe or angle:	
asbestos, sheet.....	do.....	.13		1-inch.....	each..
Pipe, galvanized iron, diameter:				1-inch.....	do.....
1-inch.....	per foot..	.02 1/2		1-inch.....	do.....
1-inch.....	do.....	.03 1/2		1-inch.....	do.....
1-inch.....	do.....	.04 1/2		1 1/2-inch.....	do.....
1-inch.....	do.....	.06 1/2		1 1/2-inch.....	do.....
1 1/2-inch.....	do.....	.09 1/2		2-inch.....	do.....
1 1/2-inch.....	do.....	.11 1/2		2 1/2-inch.....	do.....
2-inch.....	do.....	.15		Valves, brass, Chapman's:	
Pipe, wrought iron, diameter (black):				1-inch.....	do.....
1-inch.....	per foot..	.01 1/2		1-inch.....	do.....
1-inch.....	do.....	.01 1/2		1-inch.....	do.....
1-inch.....	do.....	.01 1/2		1-inch.....	do.....
1-inch.....	do.....	.02 1/2		1-inch.....	do.....
1-inch.....	do.....	.03		1 1/2-inch.....	do.....
1-inch.....	do.....	.04		1 1/2-inch.....	do.....
1 1/2-inch.....	do.....	.05 1/2		2-inch.....	do.....
1 1/2-inch.....	do.....	.07 1/2		2 1/2-inch.....	do.....
2-inch.....	do.....	.09 1/2		Valves, brass, check:	
2 1/2-inch.....	do.....	.15		1-inch.....	do.....
Pipe, lead, best.....		per pound..	.04 1/2	1-inch.....	do.....
Stop-cocks, brass, T handles:				1-inch.....	do.....
1-inch.....	each.....	.44		1-inch.....	do.....
1-inch.....	do.....	.79		1 1/2-inch.....	do.....
1 1/2-inch.....	do.....	1.25		2-inch.....	do.....
Cocks, corporation:				2 1/2-inch.....	do.....
1-inch.....	do.....	.84		Valves, globe, Jenkins's:	
1-inch.....	do.....	.64		1-inch.....	do.....
1-inch.....	do.....	.95		1 1/2-inch.....	do.....
1-inch.....	do.....	1.25		1 1/2-inch.....	do.....
NOTE.—The corporation cocks to be				2-inch.....	do.....
manufactured from metal containing the				2 1/2-inch.....	do.....
following alloy for each 100 pounds: 85.11				3-inch.....	do.....
copper, 5.32 block tin, 7.45 zinc, 2.12 lead.				Valves, check, Jenkins's:	
Each corporation cock to be capable of				1-inch.....	do.....
withstanding a hydrostatic pressure of				1 1/2-inch.....	do.....
75 pounds to the square inch, and to be				1 1/2-inch.....	do.....
made in accordance with drawings and				2-inch.....	do.....
samples in the water office.				2 1/2-inch.....	do.....
Pumps, "Common Sense," with middle				3-inch.....	do.....
sections and porcelain lined, working				Valves, gate, Rensselaer's, or equal to:	
chambers complete, same in all details				3-inch bell flange.....	do.....
as those now in use in the water de-				4-inch bell flange.....	do.....
partment.....		each..	16.33	3-inch screw ends.....	do.....
4-inch screw ends.....		do.....		4-inch screw ends.....	do.....
EXTRA PARTS OF "COMMON SENSE" PUMPS.				Waste, white cotton, per sample, best	
Middle sections.....		each..	3.50	per pound.....	
Top working parts.....		do.....	6.00	Buffalo extension water service boxes:	
Handles.....		do.....	.30	82—D—length from 2' 2" to 3' 6".....	
Air vessels.....		do.....	2.00	94—F—length from 3' 5" to 5' 5".....	
Lower boxes.....		do.....	1.25	Buffalo extension water valve boxes, size	
Spear-head irons.....		do.....	.20	C, with No. 4, base, length from 3' 3" to	
				4' 3".....	
				each..	

CLASS VIII.—Groceries.

Apples, dried, choice.....		per pound..	\$0.03 1/2	Cheese, prime, New York State cream, per	
Baking powder, Dr. Price's 1-pound				pound.....	
cans.....		per pound..	.35	Crackers, soda, best.....	
Bluing.....		per barrel..	4.00	Candles, adamantine.....	
Brandy, per sample.....		per gallon..	1.50	Currants, dried, best quality.....	
Butter, New York State (choice cream-				Corn, canned, 2-pound cans (Standard	
ery).....		per pound..	.20 1/2	Maine Pack).....	
Beans, prime, per sample (New York hand				Corn starch, best.....	
picked).....		per bushel..	1.72	Chocolate best.....	
Beef, dried (choice).....		per pound..	.12	Cocoa, best.....	
Beans, Lima, 2-pound cans (standard) per				Eggs, fresh.....	
dozen.....		do.....	.82	Essence lemon, best, 2-ounce bottles	
Codfish, salt (Georges Bank).....		per pound..	.03 1/2	(Davis & Miller), per dozen.....	
Coffee:				Essence vanilla, best, 2-ounce bottles	
Rio, green, choice, per sample.....		do.....	.17 1/2	(Davis & Miller), per dozen.....	
Maricao, green, choice, per sam-				Flour:	
ple.....		per pound..	.15	Extra, per sample.....	
Java, roasted, best, choice.....		do.....	.28 1/2	Patent process (Ceres, or equal to),	
				per barrel.....	

CLASS VIII.—Groceries—Continued.

continued.		Rice, Carolina, per sample, head, per pound.....	\$0.04 $\frac{1}{2}$
ly, best, per sample, per barrel.....	\$4.47	Sugar:	
wheat, choice..... per pound.....	.03	Brown, light, per sample, (Keystone C)..... per pound.....	.08 $\frac{1}{2}$
am..... do.....	.02 $\frac{1}{2}$	Granulated, standard..... do.....	.09 $\frac{1}{2}$
ground, Jamaica, Colburn's.....	.11	White, powdered..... do.....	.09 $\frac{1}{2}$
per pound.....	.24	Salt, fine..... per bushel.....	.33
large prime split..... per barrel.....	3.24	Soda:	
per pound.....	.23	Salt..... per pound.....	.01 $\frac{1}{2}$
do..... do.....	.01 $\frac{1}{2}$	Cooking..... do.....	.03 $\frac{1}{2}$
red, best (Cassard's)..... do.....	.06 $\frac{3}{100}$	Starch, per sample..... do.....	.02 $\frac{1}{2}$
entrated, pound cans, per sam-	.07 $\frac{1}{2}$	Soap:	
ple (Seal)..... per can.....	.07 $\frac{1}{2}$	Toilet, best, per sample (Kirk & Co's),	
per sample (prime Porto Rico),	.23 $\frac{84}{100}$	per dozen cakes.....	1.00
do.....		Castile, genuine mottled, per sample,	
& Courtney, full 200 to the box,		per pound.....	.04 $\frac{1}{2}$
ch..... per gross.....	1.58	Hard, light, per sample..... per pound.....	.02 $\frac{1}{2}$
blue heads..... per gross.....	.54	Laundry (Weaver, Kengla & Co., per	
do..... per pound.....	.06 $\frac{1}{2}$	sample) or equal to..... per pound.....	.03 $\frac{1}{2}$
pure, per sample, Colburn's		Pear's toilet, scented, 30 per cent, gly-	
er, per pound.....	.12	cerine..... per dozen cakes.....	1.65
er, white, family..... per bushel.....	.47	Babbitt, best, (2-pound cakes), per	
do..... do.....	1.25	cake.....	.04 $\frac{3}{100}$
Muscatus..... per pound.....	.03	Sirup, per sample..... per gallon.....	.26
No. 1..... do.....	.08 $\frac{1}{2}$	Tea:	
(Pratt's, with cans or equal to)		Green, per sample..... per pound.....	.23
do.....	.15 $\frac{1}{2}$	English breakfast, best..... do.....	.35
ene, 150 test, prime water, white,		Per sample (Japan uncolored)..... do.....	.23 $\frac{2}{100}$
do.....	.09 $\frac{1}{2}$	Black, per sample..... do.....	.21
rine..... per bushel.....	1.30	Tobacco, chewing, per sample, B. F.	
prime..... do.....	.57 $\frac{1}{2}$	Hanes' 3 ply or equal to..... per pound.....	.30
t, best..... per barrel.....	2.25	Tomatoes, canned, 3-pound cans (Hous-	
cucumbers)..... per 100.....	.40	ton's)..... per dozen.....	.78 $\frac{1}{2}$
dack, ground, pure, per sample,		Tallow..... per pound.....	.08
er's choice..... per pound.....	.12	Vinegar, best, Byram's pure malt, per	
est quality, Turkish per pound.....	.03 $\frac{2}{100}$	gallon.....	.08 $\frac{4}{100}$
canned, 3-pound cans (Houston's)		Whisky, per sample..... per gallon.....	1.55
do..... per dozen.....	1.59	Wine:	
ned, 2-pound cans, early June		Sherry, genuine Spanish..... do.....	1.00
er's)..... per dozen.....	1.20	Port..... do.....	1.00
best quality, London layers, 3-			
per pound.....	.12		

CLASS IX.—Boots and shoes.

ren's, for Washington Asylum,		Shoes—continued.	
sample, 4 to 10 $\frac{1}{2}$ per pair.....	\$0.54	Boys', per sample, 1 to 5..... per pair ..	\$0.78
er's, per sample, 11 to 2..... do.....	.70	Shoe strings, per sample:	
er's, for Washington Asylum, metal		Leather..... per gross.....	.30
ged brogan, per sample, 6 to 14,		Linen..... do.....	.25
pair.....	.80	Slippers, women's per sample..... per pair ..	.70
er's, for Washington Asylum,		Boots, rubber, men's, per sample:	
sample, 3 to 9..... per pair.....	.80	Short leg..... per pair ..	2.00
er's lasting polish, 3 to 9, per		Long leg..... do.....	2.80
er.....	.60		

CLASS X.—Drugs.

E.—Drugs must be delivered without extra charge for bottles, jugs, cans, or packages.]

ic (Powers & Weightman), per		Muriatic, C. P. (Powers & Weight-	
nd.....	\$0.08	man)..... per pound.....	\$0.20
ic (Powers & Weightman), per		Sulphuric, aromatic..... per pound.....	.33
ce.....	.08	Acacia, pulverized (gum arabic) (Powers	
ic (Wyeth)..... per pound.....	.20	& Weightman)..... per pound.....	.80
ic..... do.....	.15	Acetate of lead (Powers & Weightman),	
ic, Calvert's No. 4..... per pound.....	.45	per pound.....	.25
ic, crystallized..... do.....	.35	Aqua ammonia, concentrated..... per gallon.....	.12
ic (commercial)..... do.....	.07	Alum, pulverized..... per pound.....	.09
ic (Powers & Weightman), per		Ammon. carb. (Squibbs's)..... do.....	.35
nd.....	.52	Aqua cinnamon..... per gallon.....	.25
ic, C. P. (Powers & Weightman),		Ammon., bromid (Powers & Weightman),	
ound.....	.20	per ounce.....	.04
ic..... per pound.....	.12	Ammonia, iodide (Powers & Weightman),	
phoric, concentrated (Powers &		per ounce.....	.35
Weightman)..... per pound.....	.33	Ammon., muriat., granulated (Powers &	
ylic (Powers & Weightman), per		Weightman)..... per pound.....	.21
ce.....	.10	Ammon., spirits, aromatic..... do.....	.36
ic (tannin) (Powers & Weight-		Amyl, nitras (Squibbs's)..... per ounce.....	.15
man)..... per ounce.....	.09	Antifebrine..... do.....	.24
ganic (Powers & Weightman),		Antipyrin..... do.....	1.40
ounce.....	.12	Alcohol, 95 per cent..... per gallon.....	2.25

ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA. 141

CLASS X.—*Drugs*—Continued.

inned.			Spatulas, assorted..... per dozen..	\$2.70
b..... per ounce.....	\$0.06		Sulphur, pulverized..... per pound..	.03
ves..... do.....	.10		Spermaceti..... do.....	.35
reia..... do.....	.25		Sponge:	
ionis..... do.....	.09		Sheep's wool (Florida)..... do.....	1.74
roll..... per dram.....	.25		Surgeon's silk..... do.....	2.75
unge peel..... per ounce.....	.10		Spt. ether, comp., Hoffman's anodyne	
nento..... do.....	.10		(Powers & Weightman)..... per pound..	.50
i, (castor oil)..... per gallon.....	1.25		Sulphonal..... do.....	30.00
ender..... per ounce.....	.05		Spt. niter dul., sweet spirits niter (Pow-	
ppermint..... do.....	.10		ers & Weightman)..... per gallon..	.45
(olive oil)..... per gallon.....	.65		Spt. laven., Co..... per pound..	.34
huæ (cod-liver oil)..... do.....	.85		Sirup:	
nary..... per ounce.....	.05		Ferri, iodidi..... do.....	.35
l..... do.....	.15		Scillæ (squills)..... do.....	.16
num..... per pound.....	.35		Pruni virg. (wild cherry)..... do.....	.20
mercury..... per ounce.....	.14		Strychnia, sulph..... per drachm..	.14
of tar..... do.....	.03		Santonine (Powers & Weighman), per	
n:			ounce.....	.30
(Powers & Weightman), per			Trypsin..... do.....	1.00
nd.....	.32		Tincture:	
i (Powers & Weightman), per			Aloes..... do.....	.02
nd.....	2.65		Lobelia..... do.....	.03
, crys (Powers & Weightman),			Assafetida..... do.....	.03
ounce.....	.02		Aconit., R..... do.....	.03
b (Powers & Weightman), per			Arnica..... per gallon..	1.04
nd.....	.14		Orris..... per ounce..	.03
id (Powers & Weightman), per			Tablets, hypodermic:	
nd.....	.34		Of ergotin, 100 tablets in bottle,	
anganate (Powers & Weightman),			(Sharp & Dohme), $\frac{1}{16}$ grain, per	
pound.....	.35		bottle.....	.53
ar., comp., sugar-coated (Sharp			Sulph. of morphia, (Sharp & Dohme),	
ne, per pound.....	1.00		100 in bottle, $\frac{1}{16}$ and $\frac{1}{32}$ grain, per	
l., strich. et. bellad., No. 2 (Sharp			bottle.....	.40
ne), per pound.....	10.00		Sulph. of atropia, (Sharp & Dohme),	
nte, blue and red..... per ream..	2.15		100 in bottle, $\frac{1}{16}$ grain, per bottle..	.35
ophyllin Co. (Sharp & Dohme)			Apomorphia, (Sharp & Dohme), 100	
pound.....	3.75		bottle, $\frac{1}{16}$ grain..... per bottle..	.05
Alcock's Porous..... per dozen.....	1.08		Aconitine, (Sharp & Dohme), 100 in	
algic (Brown Seward) S. & D.,			bottle, $\frac{1}{16}$ grain..... per bottle..	.15
lin..... per ounce.....	.70		Digitaline (Sharp & Dohme), pure,	
	.13		100 in bottle, $\frac{1}{16}$ grain..... per bottle..	.50
fectant, Egyptian carbolic, per			Morp. atrop., Nos. 1 and 4 (Sharp &	
nd.....	.09		Dohme), 100 in bottle..... per bottle..	.55
fecting, Sanitas..... per pound..	.01		Pilocarpine muriate, 100 in bottle, $\frac{1}{16}$	
t, Persian, light..... do.....	.40		grain..... per bottle..	.95
sulph. (Powers & Weightman),			Tincture:	
ce.....	.35		Gentian, Co..... per pound..	.25
sulph. (Powers & Weightman),			Guaiac..... per ounce..	.05
ice.....	.35		Iodini..... per pound..	.35
powdered..... per pound.....	.45		Myrrhæ..... do.....	.25
ood, naphtha..... per ounce.....	.05		Opil, laudanum..... do.....	.45
	.18		Vaseline..... do.....	.25
id..... per pound.....	.45		Valerian, powdered..... do.....	.20
b (Powers & Weightman) do.....	.04		Ung. hydrarg., 10 per cent..... per ounce..	.04
l (Powers & Weightman) do.....	1.45		Vinam antimonii..... per pound..	.15
stass, tart, Rochelle salts (Pow-			Ung. hydrarg., nitras..... per ounce..	.05
& Weightman)..... per pound..	.30		Wax, best white..... per pound..	.40
stile, white, Conti's best..... do.....	.12		Wine of tar..... do.....	.30
sh, mottled..... do.....	.05		Zinc:	
dic..... do.....	.12		Chloride (Powers & Weightman), per	
amois, 25 by 33 inches..... each..	.35		pound.....	.50
			Sulph., (Squibbs)..... per pound..	.25
			Zingiberis, Jam, pulv..... do.....	.15

CLASS XI.—*Glass, paints, and varnish.*

Oils, varnish, etc., must be delivered without extra charge for cans, jugs, bottles, or boxes.]

5 per cent..... per gallon.....	\$2.25	Blue:	
m..... do.....	.70	Ultramarine, dry..... per pound..	\$0.14
..... do.....	.10	Ultramarine, in oil..... do.....	.20
sh, dry..... per pound.....	.02	Prussian, dry..... do.....	.20
sienna, dry..... do.....	.05	Prussian, in oil..... do.....	.30
sienna, in oil..... do.....	.13	Brushes:	
tumber, in oil..... do.....	.10	Paint, Clinton's, 5-0..... each..	1.00
e's metallic, dry..... do.....	.014	Paint, Clinton's, 6-0..... do.....	1.25
ap:		Wall, Clinton's, 3-inch..... do.....	.35
pers, dry..... do.....	.08	Wall, Clinton's, 3 $\frac{1}{2}$ -inch..... do.....	.45
lie's refined," in papers, dry,		Wall, Clinton's, 4-inch..... do.....	.60
pound.....	.15	Wall, Clinton's, 4 $\frac{1}{2}$ -inch..... do.....	.75
nt:		Wall, Clinton's, 5-inch..... do.....	1.00
..... per pound.....	.10	Sash tools, No. 6..... do.....	.15
coach..... do.....	.10	Sash tools, No. 7..... do.....	.20
		Sash tools, No. 8..... do.....	.25

CLASS XL.—Glass, paints, and varnish—Continued.

Brushes—Continued.			Wicks:		
Sash tools, No. 9	each	\$0.30	No. 0	per gross	\$0.39
Sash tools, No. 10	do	.35	No. 1	do	.45
Chimneys, lamp:			No. 2	do	.49
No. 0	per dozen	.30	Yellow, chrome:		
No. 1	do	.35	Extra dry	per pound	.15
No. 2	do	.50	No. 1, in oil	do	.18
Driers:			Yellow French ochre:		
Patent liquid	per gallon	.30	In oil	do	.10
Japan	do	.55	Dry	do	.02
Litharge	per pound	.07	Glass equal to Chesapeake brand, as follows:		
Glazier's points	per package	.08	8 by 10	per light	.02
Green:			8 by 20	do	.06
Chrome, dry	per pound	.08	9 by 12	do	.03
Chrome, in oil (best)	do	.15	9 by 14	do	.04
Imperial French, dry	do	.10	9 by 18	do	.06
Imperial French, in oil	do	.15	9 by 24	do	.08
Paris, dry	do	.15	10 by 12	do	.04
Glue:			10 by 14	do	.05
Cooper's, white	do	.20	10 by 16	do	.06
Common	do	.10	10 by 18	do	.06
White	do	.15	10 by 20	do	.08
Irish	do	.16	10 by 22	do	.08
Liquid	per pint	.34	10 by 24	do	.09
Gum shellac	per pound	.25	12 by 12	do	.05
Hard oil finish, walnut	per gallon	1.00	12 by 14	do	.07
Lead, Lewis' white, in oil	per pound	.06½	12 by 16	do	.07
Oil:			12 by 18	do	.08
Sperm	per gallon	.85	12 by 20	do	.09
Linseed, raw	do	.59	12 by 23	do	.10
Linseed, boiled	do	.62	12 by 24	do	.11
Lard, winter strained	do	.62	12 by 26	do	.11
Neat's foot	do	.60	12 by 28	do	.11
Cylinder, best	do	.50	12 by 32	do	.15
Machine	do	.40	12 by 33	do	.16
Spirits of turpentine	do	.45	14 by 14	do	.06
Plaster of Paris	per barrel	2.00	14 by 16	do	.06
Putty:			14 by 18	do	.10
White	per pound	.02	14 by 20	do	.11
Colored	do	.03	14 by 21	do	.11
Plumbago	do	.05	14 by 22	do	.12
Red lead:			14 by 24	do	.12
Dry	do	.06½	14 by 25	do	.15
In oil	do	.10	14 by 28	do	.16
Red, vermilion:			14 by 30	do	.17
English, dry	do	.60	16 by 16	do	.10
American, dry	do	.20	16 by 18	do	.10
In oil, English	do	.80	16 by 20	do	.12
Red, Indian:			16 by 22	do	.13
Dry	do	.10	16 by 26	do	.16
In oil	do	.15	16 by 32	do	.20
Red, Venetian:			18 by 20	do	.12
In oil	do	.10	18 by 30	do	.22
Dry	do	.02	18 by 36	do	.30
Rotten stone, powder	do	.05	18 by 38	do	.31
Rosin, N. C.	do	.02	20 by 20	do	.18
Varnish:			20 by 24	do	.22
No. 1, coach	per gallon	1.50	20 by 28	do	.25
Coach, wearing body	do	3.00	22 by 24	do	.22
Furniture (turpentine)	do	.85	22 by 44	do	.50
Damar	do	1.50	22 by 46	do	.62
Pure shellac	do	2.50	22 by 30	do	.30
Whiting	per pound	.01½	28 by 28	do	.35
Wicking, lamp, cotton	do	.25			

CLASS XII.—Lumber*

Ash, all widths and lengths, prime:			Georgia pine, 4-4, No. 1 heart	per M.	\$24.75
4-4	per M.	\$47.00	Clear heart, 8-4 and under (all lengths and widths)	per M.	25.00
8-4	per M.	49.00	Joists and scantling, Virginia pine, all sizes under 22 feet in length, per M.	13.00	
Cedar posts, 8 feet long, 8 inches in diameter at large end	each	.28	All sizes 22 feet in length and over, per M.	15.00	
10 feet long, 10 inches in diameter at large end	each	.44	Joist, scantling, and timber, white pine, all sizes, under 30 feet in length, per M.	23.00	
Each additional foot over 10 feet, per foot		.04	All sizes, 30 feet in length and over, per M.	33.00	
Cherry, prime, all widths and lengths, per M.		95.00	Joist, scantling, and timber, Georgia pine, all sizes under 22 feet in length, per M.	23.00	
Flooring, Virginia, 4-4 and 5-4, No. 1, 3½ inches and under	per M.	21.75	All sizes 22 feet and over in length, per M.	26.00	
White pine, 5-4 and 4-4, select, No. 1, per M.		37.50			
Georgia or Florida, 4-4 and 5-4 heart, No. 1, 3 inches and under	per M.	29.00			

CLASS XII.—Lumber—Continued.

Set, spruce	per M.	\$2.60	4-4 stock culls, 1 x 12	per M.	\$14.00
White oak, 2 and 3 inch (prime),			Selects, 6-4	do.	20.00
gtb under 22 feet	per M.	25.00	Timber, all sizes, 30 feet and under,		
er, white oak, 12 x 12 and under,			per M.		16.50
n 22 feet long	per M.	27.50	Clear, 8-4 and under	per M.	15.00
k, 2 and 3 inch (sound common			White pine, fine common, dressed 2 sides:		
white oak), any lengths re-			4-4	per M.	35.00
.....	per M.	22.00	5-4	do.	38.00
li widths and lengths, prime:			6-4	do.	38.00
.....	per M.	27.50	8-4	do.	38.00
.....	do.	26.00	White pine, Michigan selects:		
.....	do.	24.00	4-4, dressed 2 sides	per M.	40.00
.....	do.	32.00	4-4, partition stuff, 3½ inches wide, per		
.....	do.	24.00	M		40.00
.....	do.	32.00	5-4, dressed 2 sides	per M.	43.00
No. 1, cypress hearts, width 6			6-4, dressed 2 sides	do.	43.00
length 20 inches	per M.	7.25	8-4, dressed 2 sides	do.	43.00
White pine, No. 1	do.	20.00	White pine:		
.....	do.	15.00	4-4 culls (stock), dressed 2 sides	do.	19.00
5-4, heart, Florida	do.	31.50	4-4 culls (stock), not dressed	do.	19.00
ok, 1½ inches square by 12 inches			6-4 culls (stock)	do.	20.00
arpened at one end	per M.	8.00	8-4 uppers, dressed 2 sides	do.	52.00
pine:			6-4, uppers, dressed 2 sides	do.	52.00
alls, 7 inches wide and over, 12,			4-4, uppers, dressed 2 sides	do.	50.00
and 16 feet long	per M.	11.50	Dressing, 1 or 2 sides	do.	5.00

CLASS XIII.—Forage.

[Hay must be delivered baled or loose, as required.]

pounds to the bushel), per 100			Flaxseed, best quality (32 pounds to		
.....	\$0.90		bushel), per pound	\$0.64	
d and cleaned (56 pounds to the			Oats, prime white, re-cleaned (no new oats		
hel) .....	.55		received, 32 pounds to the bushel), per		.42
r (35 pounds to the bushel), per			bushel .....		.95
hel .....	.30		Shorts (28 pounds to the bushel), per 100		.80
timothy, prime (net weight)			pounds		1.25
..... 100 pounds .....	.90		Straw, long rye, bright, per 100 pounds		1.00
prime (net weight), per 100			Rye chop (28 pounds to the bushel), per		
nds	1.00		100 pounds .....		.95
(48 pounds to the bushel), per			White middlings (35 pounds to the bush-		.01½
pounds	1.05		el)		
			per 100 pounds		
			Brown middlings (28 pounds to the bush-		
			el)		
			per 100 pounds		
			Rock salt, lump		

CLASS XIV.—Fresh meat and corned beef.

Best quality	per pound..	\$0.10	Corned beef, best quality	per pound..	\$0.02½
Is, best quality	do.	.06½	Mutton, best quality	do.	.04½
s, sirloin	do.	.12	Veal, best quality	do.	.07
other t	do.	.02½			
ad	do.	.02½			

CLASS XV.—Bacon and ham.

Bacon, Western shoulders	per pound..	\$0.11½	Bacon, Western shoulders	per pound..	\$0.06½
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CLASS XVI.—Lamp-posts and miscellaneous castings.

osts present pattern, 280 pounds,			Miscellaneous castings—Alley grates,		
anges, arms, and iron wedges, in-			drops, manhole frames and covers,		
g one coat of red-lead paint, arms			pump grates, and all other castings		
tapped and drilled for two bolts,			which may be ordered by Commissioners,		
.....	\$5.98		District of Columbia, as per samples,		
			patterns, or drawings to be furnished		
			from time to time	per pound..	\$0.01½
			Manhole irons, wrought iron	each .....	.09

CLASS XVII.—Fuel.

umberland (run of mine)	per ton..	\$3.19	Wood:		
int	do.	6.00	Oak, long	per cord..	\$4.50
d-ash, egg	do.	5.48	Oak, sawed and split	do.	5.30
d-ash, stove	do.	5.73	Pine, long	do.	4.24
d-ash, chestnut	do.	5.25	Pine, sawed and split	do.	5.30
hite-ash, furnace	do.	4.93	Prices for stowing coal (about 6,000 tons)		
hite-ash, egg	do.	5.13	per ton .....		.12
hite-ash, stove	do.	5.28	Prices for stowing wood (about 450 cords)		
hite-ash, chestnut	do.	4.95	per cord .....		.25
kens' Valley, stove	do.	6.00			

CLASS XVIII.—Dry goods.

Blankets:		Flannel, wool—Continued.	
10-4, woolen, white, 7 pounds, Saxony, or equal to	per pair..	Gray, per sample	per yard.. \$0.24
Colored, wool, per sample (7 pounds)	per pair..	Gingham, per sample	do. 06
	1.89	Do	do. 04
Buttons:		Hose, women's:	
For shirts, porcelain, No. 20, per gross	05	Cotton, per sample	per pair.. 07
For drawers, porcelain, No. 30, per gross	07½	Wool, per sample	do. 17½
For coats, horn, black	per gross.. 15	Blue mixed, per sample	do. 08
For pants, metal	do. 06	Hose, children's, per sample	do. 08½
Bedspreads, white, per sample	each.. 88½	Kentucky jeans, per sample	per yard.. 10
Calico, as per sample	per yard.. 05	Needles, assorted sizes	per paper.. 08
Crash toweling, 20-inch, per sample, per yard	10½	Melton, per sample, for almshouse men, per yard	35
Cotton:		Pillow-slips, any size	each.. 12½
Unbleached, 4-4 wide, Laurel D, improved, per sample, per yard	06 2½	Prison cloth, 6-4 wide, strip 4½-inch wide, woolen, per sample, per yard	75½
Sheeting, 6-4 wide, Fruit of Loom, per sample, per yard	12 5/16	Pins	per paper.. 08
5-4 wide (bleached) per sample, per yard	10 5/16	Sheets:	
Spool, Clark's	per dozen.. 42	8-4 wide, 2½ yards long	each.. 44
Unbleached, yard wide, for women's underclothing, per sample, per yard	06 5/16	10-4 wide, 2½ yards long	do. 50
Flannel, wool:		Socks, men's, woolen, per sample, per pair	11
Red, per sample	per yard.. 21 4 7/8	Shirting, hickory, per sample	per yard.. 07½
		Thread, brown and white, linen, best (spool)	per dozen.. 74
		Ticking for bed sacks, 4-4 wide, Omega A. C. A., per sample	per yard.. 11 1/16
		Towels, per sample	per doz.. 1.85

CLASS XIX.—Ice.

Ice (best Kennebec, or equal to)	per 100 pounds..	\$0.50
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CLASS XX.—Telegraph and telephone supplies.

Sheets—Continued.		Office wire (copper), wound and braided, paraffined and polished:	
Sulphate of copper (bluestone), best quality	per pound..	No. 16	per pound.. \$0.23
Sul ammonia, best	do. 08	No. 18	do. 23
Sheet copper, No. 30 (Brown & Sharp's gauge), cut in strips to order, per pound	24	Copper wire, duplex insulation:	
Molded zincs, amalgamated, for LeClanche battery	each.. 03½	No. 14	per foot.. 61
Molded zincs, crowfoot	per pound.. 08	No. 16	do. 61
LeClanche porous cells, charged, per cell	23	Register paper, cut and wound on spools to order	
Glass jars, No. 1:		to order	per pound.. 12
5 by 7 inches	each.. 12½	Double telephone cords:	
6 by 8 inches	do. 16	Tips complete	each.. 13
LeClanche battery, complete	38	Short	do. 15
Gasner's dry battery, complete	95	Glass screw (insulators), Western Union, per hundred	
The National Galvanic Battery	49		2.70
Cold-drawn copper wire, No. 12, per pound	15	Brackets, screw, oak, painted, per hundred	
Galvanized iron wire, extra best, best quality:			1.27
No. 9	per pound.. 04½	Double-pointed (telegraph) tacks, per pound	
No. 12	do. 04½		12
Copper wire, okonite insulation:		Cross-arms, 3½ by 4½, best white pine, painted, with pins, complete, per linear foot	
No. 16	per foot.. 01 5/16		06½
No. 12	do. 02 4/16	Screw-bolts, with washers, ½-inch by 7 inches	
			per hundred.. 2.28
		Climbers, extra-spring steel with straps (Stubbs)	
			per pair.. 1.60

REPORT OF CHIEF CLERK OF WATER DEPARTMENT.

ENGINEER DEPARTMENT,
Water Office, November 10, 1890.

SIR: I have the honor to submit the following report of the operations of the water department, including a financial statement covering the receipts and expenditures, for the year ending June 30, 1890:

Table 1.—Statement of assessment and collection of water-main tax from July 1, 1878, to July 1, 1890, showing receipts of \$363,144.12.

Table 2.—Statement of receipts of the water department from all sources from July 1, 1878, to June 30, 1890, showing receipts of \$1,997,368.48.

Table 3.—Statement of expenditures from 1879 to 1890, showing total expenditures of \$1,065,044.97.

Table 4.—Statement of advances to the United States from 1880 to 1890, inclusive, showing amount advanced \$819,576.33.

Financial statement for the fiscal year ending June 30, 1889-'90, showing—

Receipts	\$254,081.56
Expenditures	253,675.74

There were—

Inspections	44,821
Leaks found	5 105
Leaks repaired	4,996
Wastes found	142
Warrants procured	123
Fines	\$150
Forfeits	\$140
Bonds taken	56
Cases discussed	26
Bills delivered	30,361
Meters set during year	25
Total numbers of meters in use	87

Respectfully,

Capt. JAS. L. LUSK,
Assistant to Engineer Commissioner.

JNO. J. BEALL,
Chief Clerk Water Department.

TABLE 1.—Statement of assessments and collection of water main tax from July 1, 1878, to June 30, 1890.

Fiscal year.	Amount assessed.	Duplicate payments and over-payments.	Six per cent. abatement.	Amount of tax canceled subsequent to July 1, 1878.	Amount collected July 1, 1878, to June 30, 1890.	Amount outstanding July 1, 1890, subject to exemption act of March 3, 1881.	Amount of collectible tax outstanding July 1, 1890.
(*)	\$94,124.78	\$154.31		\$3,271.71	\$77,818.38	\$4,060.10	\$9,128.90
1879	11,488.89	38.96	\$138.54	79.24	10,419.09	53.68	837.30
1880	4,965.13		150.40		4,721.56		87.17
1881	7,775.35		265.78	316.07	6,495.85		697.65
1882	3,313.89		67.40		3,071.00		175.49
1883	3,495.75		91.62		3,395.67		8.46
1884	23,325.37		399.73	281.06	19,718.75		2,925.83
1885	27,492.36	.39	662.58		24,323.03		2,507.14
1886	40,547.79	2.00	1,311.03	1,003.72	33,281.34		4,953.70
1887	47,345.86	67.44	1,458.17	206.24	40,020.18		5,533.71
1888	21,594.48	342.60	1,045.99	1,123.54	19,279.19		488.36
1889	51,240.96	35.91	1,648.32	1,384.50	39,742.64		8,181.89
1890	25,768.17	23.73	865.43	873.05	14,904.49		9,148.93
Total	362,478.78	665.34	8,625.51	8,539.13	297,191.17	4,113.78	44,674.53

* Amount of tax outstanding and uncollected July 1, 1878.

† Amount of abatement allowed property owners on College Hill for amounts paid by them to R. A. Charles.

‡ Amount of abatement allowed on tax assessed in fiscal year ending June 30, 1889, but not paid until after July 1, 1889.

§ Ninety-six cents is deducted from abatement of this year on account of duplicate payment of tax in which an abatement was allowed.

RECAPITULATION.

Total amount of assessments plus duplicate payments	\$363,144.12
Amount of abatement at 6 per cent.	8,401.76
Amount of abatement allowed property owners on College Hill for amounts paid by them to R. A. Charles	223.75
Amount of tax canceled and struck off the books since July 1, 1878:	
By order of Commissioners, District of Columbia, various dates	4,241.24
By reason of issue of erroneous tax certificates	332.38
By act of Congress for relief of E. W. Patterson, approved June 13, 1885	215.68
By reason of subdivision of property	816.17
By amount charged against District of Columbia	1,391.79
By amount charged against the United States	640.30
By amount canceled by decision Supreme Court, District of Columbia	901.57
By amount subject to exemption, act March 3, 1881	4,113.78
Amount of tax collected from July 1, 1878, to June 30, 1890	297,191.17
Amount outstanding July 1, 1890, collectible tax	44,674.53

363,144.12

TABLE 2.—Statement of receipts of the water department, District of Columbia, from July 1, 1878, to June 30, 1890.

Fiscal year.	Balance on hand July 1, 1878.	Mains to Government Printing Office.	Water-main tax.		Interest water-main tax.		Water rents.	Taps.	Permits and other sources.	Total receipts.
			Advertised.	Current.	Advertised.	Current.				
Balance on hand July 1, 1878	\$16,809.42									\$16,809.42
Received year ending June 30—										
1879			\$6,193.59	\$12,463.10	\$1,635.96	\$1,059.53	\$43,574.24	\$1,986.00	\$2,139.25	\$69,053.67
1880			10,248.87	11,936.81	3,457.43	1,340.18	165,641.42	1,980.00	2,188.10	196,782.81
1881			3,200.38	18,368.39	1,228.94	4,040.08	109,737.83	1,851.00	1,913.72	140,342.34
1882			4,017.92	3,305.50	2,086.07	392.34	101,621.10	1,815.00	1,780.71	117,827.64
1883		\$2,800.00	7,320.13	5,467.06	3,769.83	350.54	65,752.24	2,193.00	2,188.72	88,792.42
1884		1,750.00	3,563.12	8,700.53	2,385.89	122.42	119,610.20	2,373.00	2,418.79	139,173.65
1885			3,282.57	14,430.22	2,598.81	297.28	118,528.20	3,402.00	3,076.09	145,585.17
1886			3,564.81	29,631.30	2,343.44	622.49	134,896.22	5,096.00	3,459.03	169,613.29
1887			7,630.50	34,874.59	3,183.62	1,494.53	138,539.49	6,012.00	4,846.45	196,581.18
1888			8,605.53	19,939.91	5,130.55	598.86	171,892.49	4,182.00	4,809.92	215,149.26
1889			5,524.26	36,464.29	3,192.09	1,099.94	189,407.39	5,190.00	5,576.16	246,454.13
1890			9,207.61	29,257.28	5,364.04	1,557.62	197,053.34	5,313.72	6,327.95	254,081.56
Repayments during various fiscal years										1,121.94
Total	16,809.42	4,550.00	72,361.29	224,829.88	36,366.37	12,945.81	1,546,254.10	41,393.72	40,735.89	1,997,368.48

* This does not include \$12.50 which the United States Treasurer has credited to this year's receipts, but which does not appear on books of water department.
 † December 10, 1880, there was collected \$10.75 on account of water-main tax (advertised), which sum was deposited to the credit of "arrears of general taxes."

TABLE 3.—Expenditures.

Fiscal year.	Purchase of pump-house lot.	Material and labor in 20 and 24 inch main, Fourteenth street, west.	Purchase of new pumping engine and boilers.	Material and labor, pumping expenses and pipe distribution.	Salaries, water department.	Contingent expenses.	Water rent refunded.	Water-main tax refunded.	Interest on water-main tax refunded.	Erection of stand-pipe.	Water-main to Government Printing Office.	Total expenditures.
Expended in—												
1879.....	2,275.00			\$14,871.89	\$7,710.00	\$506.09	\$164.51	\$29.12	\$9.07	\$29,395.40		\$22,686.08
1880.....				48,752.55	10,417.61	962.19	32,130.10	35.26	15.47	3,237.47		95,550.65
1881.....				52,781.67	10,830.00	1,141.10	284.69		5.55	1,680.39		96,623.40
1882.....				42,334.11	11,670.23		152.21	9.14	7.18			54,172.87
1883 on account of 1882.....				3,523.73								3,523.73
1883 on account of 1883.....				43,551.24	9,339.00	1,009.43	303.38	38.96	22.41		5,500.94	59,894.36
1884 on account of 1883.....				5,950.26		819.23						6,769.49
1884 on account of 1884.....				46,454.04	9,339.00	1,548.12	590.01	80.79	82.78		3,346.27	61,441.01
1885 on account of 1884.....				102.00		8.75						110.75
1885 on account of 1885.....				941.11		223.61						1,164.72
1885 on account of 1886.....				79,878.66	9,312.90	1,954.07	373.44					91,519.07
1886 on account of 1885.....				17,472.69		109.83						17,582.52
1886 on account of 1886.....				58,655.72	9,339.00	2,148.63	385.08					70,528.43
1887 on account of 1885.....						8.00						8.00
1887 on account of 1886.....				10,847.18		230.68						11,086.86
1887 on account of 1887.....				73,598.68	9,522.29	2,392.26	580.77	59.57				86,153.48
1887 on account of 1888.....				16,796.19								16,796.19
1888 on account of 1886.....				1,046.43								1,046.43
1888 on account of 1887.....				239.85								239.85
1888 on account of 1888.....				1,046.18		2.88						1,049.41
1889 on account of 1883.....				75,616.18	9,536.00	2,364.66	982.27	342.60				95,657.92
1889 on account of 1886.....				10.00		10.00						10.00
1889 on account of 1887.....				1,541.13		250.55						1,791.74
1889 on account of 1888.....				5,828.18	5.00							5,833.18
1889 on account of 1889.....				95,019.42	15,632.62	2,169.69	1,178.78	35.91				115,735.72
1890 on account of 1888.....						16.30						16.30
1890 on account of 1889.....				2,194.72		393.87						2,488.59
1890 on account of 1890.....				58,560.98	15,314.55	1,816.50	788.37	23.73	2.07			90,277.59
Total.....	2,275.00	13,771.39	33,041.24	786,598.67	127,369.01	20,121.97	37,908.61	655.08	144.53	34,213.26	8,946.21	1,065,044.97

TABLE 4.—*Advances to Treasurer United States, ex-officio commissioner of sinking fund, District of Columbia.*

Fiscal year.	Interest and sinking fund water stock bonds.	Interest and sinking fund increasing water supply.	Total interest and sinking fund.
1880.....	\$74,025.00	.....	\$74,025.00
1881.....	74,123.77	.....	74,123.77
1882.....	43,796.08	.....	43,796.08
1883.....	44,610.00	.....	44,610.00
1884.....	44,575.00	.....	44,575.00
1885.....	44,610.00	\$13,686.23	58,296.23
1886.....	31,485.00	55,947.27	86,432.27
1887.....	57,735.00	.....	57,735.00
1888.....	31,485.00	57,239.02	88,724.02
1889.....	44,610.00	76,655.69	121,265.69
1890.....	44,610.00	81,283.26	125,893.26
Total.....	535,664.85	283,911.47	819,576.32

RECAPITULATION.

To amount collected, of which there has been deposited in the United States Treasury and credited to water fund the sum of.....	\$1,997,300.00
By amount expended from July 1, 1878, to June 30, 1890.....	1,065,000.00
By amount advanced to Treasurer United States, <i>ex-officio</i> commissioner sinking fund, District of Columbia, during said period.....	819,576.32
By amount collected on account of water-main tax, and deposited to credit of general taxes, December 20, 1880.....	112,723.68
Balance to credit of water fund, District of Columbia, July 1, 1890.....	112,723.68
	1,997,300.00

REPORT OF CAPT. JAS. L. LUSK, ASSISTANT TO THE ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA, UPON SUBJECT OF SEWAGE DISPOSAL. (REPORT OF SUPERINTENDENT OF SEWERS APPENDED.)

DISTRICT OF COLUMBIA,
OFFICE OF THE ENGINEER COMMISSIONER,
Washington, June 5, 1890

SIR: I have the honor to forward herewith a report upon the disposal of the sewer of the District, submitted under date of February 10, 1890, by Mr. D. E. McComb acting superintendent of sewers. Accompanying the report is a map giving a general location of the main features of the plan recommended by Mr. McComb.

For reasons stated in the report transmitted, as well as in my annual report of last year, it was found impracticable to make certain observations and experiments deemed necessary to a thorough investigation of the problem of sewage disposal.

The work left undone consisted of gaugings and current measurements in the river and gaugings of certain sewers in dry weather and during heavy rainfalls, and borings along the lines of proposed sewers. As this work was vitally essential as a basis for determining the probable cost of construction, it has not been thought practicable to present estimates herewith, which under the circumstances would be only approximations. My remarks in this connection will therefore be confined to a brief statement of general conclusions.

Owing to the existence through the business portion of Washington of the depression formerly occupied by the Washington Canal, to which the drainage of a large area is tributary, the question of sewage disposal is inseparably connected with that of protecting the low area in question from flooding due to local rainfall, as well as from overflow during extraordinary freshets in the Potomac. Two questions, therefore, arise as follows: 1, Disposal of the sewage; 2, protecting the low area from overflow.

SEWAGE DISPOSAL.

So far as I am able to discover, no reliable gaugings of the low-water discharge of the Potomac have been made for a quarter of a century. A series of gaugings was contemplated for the purposes of the report, but could not be undertaken for the reasons stated. It is probable, however, that the character of the surface of

inage area has not so changed in the interval named as to greatly affect the mean charge for the low-water season. This appears to be ample to safely dilute the charge due to a population of half a million, if the point of outfall be properly sen. It is not thought probable that the limit of population named will be hed before 1925.

therefore recommend the adoption of the method of crude disposal instead of any he more costly methods, which, on a scale suited to the needs of the District, may termed experimental, so far as concerns their application within the United States.

THE POINT OF OUTFALL.

o determine this point with certainty a complete system of float observations s projected. It was found practicable to complete but little of this work, and what done was at somewhat unfavorable stages of the river. From theoretical- con- erations, however, I am led to believe that a discharge in front of the city of any ge proportion of the sewage will prove objectionable before the lapse of many rs. I therefore recommend that a point of outfall be chosen far enough from the th of the Eastern Branch to prevent the sewage from reaching that estuary ext t in a greatly diluted state. The precise location of the point adopted should be to be determined by float experiments yet to be made, but is, I believe, to be ght rather below than above the mouth of the Eastern Branch, as recommended by McComb.

he method which I should propose is that, practically speaking, all of the sewage collected by a system of intercepting sewers, conveyed to a central pumping sta- , and there pumped to a sufficient height to enable it to flow through a siphon ler the Eastern Branch, and thence by a sewer to the point chosen for the dis- ge into the Potomac.

INTERCEPTING SEWERS.

hese, as needed at present or likely to be demanded in the near future, are as ows, from the eastward:

FOR SEWAGE.

1. Eastern branch (left bank) interceptor.
2. Eastern branch (right bank) interceptor.
3. Washington Canal interceptor.
4. James Creek Canal interceptor.
5. Tiber Valley interceptor.
6. Water street interceptor.
7. Rock Creek Valley intercepting system.

PROTECTION OF THE LOW AREA.

has been proposed to raise this area above the level of the highest observed het in the Potomac. The actual cost of the work to be done in raising the streets alleys and in providing new pavements, sewers, water and gas mains, etc., ld be great, while the additional expenditures on account of damage to property, rruption and destruction of business, and claims for injury to health, would, I eve, make the ultimate outlay far beyond what is required for a complete and sfactory solution of the question. To keep out the flood waters of the Potomac uires only that the sewers should be so arranged as not to give entrance to those ers, and that a dyke should be raised at the upper end of the valley of the Wash- on Canal, and one near the lower end of James Creek Canal. The locations of se dykes as recommended by Mr. McComb, will, I believe, prove satisfactory.

storm water interceptor should be built along F street north through the White , and on C street and New York avenue, discharging at Easby's Point. A second rceptor of this kind, should be built in the Mall leading westward, as near as ticable to north B street, and, turning southward, should discharge into the hington Channel at Long Bridge. A third storm water interceptor should lead u the intersection of Indiana avenue and C street through Arthur Place, the Cap- Grounds, Delaware avenue, and Canal streets to the Eastern Branch. It will be ssary to discharge more or less sewage into each of these sewers, but all sewage s discharged must be intercepted and carried to the pumping station.

o provide for carrying storm water from the low area, an interceptor must be con- cted, following closely the line of the Washington Canal sewage interceptor. To this storm water and discharge it into the Eastern Branch, additional machinery t be provided at the pumping station.

This station should be placed as near as practicable to the Eastern branch. The exact position must be determined upon after the lines of the intercepting sewer have been definitely located. For the present, I am inclined to regard the intersection of Georgia avenue and Half street, southeast, as the most suitable point.

The machinery should be of sufficient capacity to lift all the sewage, and of the storm water as can not be more economically got rid of by gravity.

A detailed survey, as a preliminary to construction, would probably lead to the modification of some of the lines of sewers indicated on the plan. The adoption of the project for the regulation of the Eastern branch, including the reclamation of the flats of that stream, might also lead to a material change in the location of the pumping station.

While it is a matter of regret that the means at the command of the sewer commission have not been sufficient to allow a detailed report to be prepared, it is to be hoped that, within a short time, a full report upon this important question may be made from the board appointed by the President, as provided in the act approved March 2, 1889.

The gentlemen composing this board have had wide experience in designing sewer systems on a large scale, and have given to the local problem the most painstaking consideration. I am under obligation to them for tables and other valuable bearing upon the subject under discussion.

The advantages to be derived from the constructions herein outlined are as follows:

- (1) The prevention of flooding in the low area.
- (2) The obliteration of the sewer canals.
- (3) Improved sanitary condition of Rock Creek and the Eastern Branch.
- (4) The prevention of serious contamination of the Potomac along the front of the city.
- (5) Generally improved sanitary conditions throughout a large part of the District.

It is probably true that among the many serious questions involving the interests of the District which now engage the attention of Congress, there is no one which can present more urgent claims to prompt recognition than the system of improvements included in the general term, "Disposal of the sewage."

Very respectfully,

JAS. L. LUSK,
Captain of Engineers, U. S. Army.

Lient. Col. HENRY M. ROBERT,
*Corps of Engineers, U. S. Army,
Engineer Commissioner, District of Columbia.*

FEBRUARY 10, 1889.

SIR: I have the honor to submit the following report upon the disposal of the sewage of Washington, D. C.:

In my annual report as acting superintendent of sewers for the year ending March 30, 1887, there is contained the following statement and recommendation:

"Probably the most important project for sewer work in this city is that having in view the intercepting of sewage from the present main sewers and its conveyance to deep water. The sewage pollution of James Creek Canal, Seventeenth-street canal, Rock Creek have become sources of reasonable complaints, and the health of the community will suffer if these outlets are left to discharge their loads of sewage into these shallow canals, which will become worse every year with the added burden of filth due to the increase of population. I respectfully recommend that an appropriation of \$5,000 be requested for the necessary examinations and plans."

The appropriation bill for the year 1888-'89 contained an item of \$5,000 for "preparation of plans for sewerage disposal." The bill was passed late in the year of 1888, and the proposed float observations in the river and the work of gauging low-water discharge in the main sewers were necessarily deferred until the following spring. Locations of the old city sewers (the records of which were imperfectly made, and much valuable information was collected and transferred to the new plans.

In April, 1889, the float observations in the river were commenced, but the stages of water in the river compelled a suspension of this work to be resumed. It was supposed, later in the season, when, ordinarily, the most satisfactory would have been obtained. The unfavorable conditions continued beyond July, and the office was informed by the Treasury Department that, as this station, though for a specific purpose, was included in an annual appropriation for it could not be used after July 1, 1889. This unexpected decision made it impossible to complete the float observations or to gauge the main sewers, the principal objects for which the appropriation was requested.

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The object for which the appropriation was made has been considered with care, and a general plan has been prepared showing the proposed line of sewers herein recommended.

DISPOSAL OF SEWAGE OF WASHINGTON, D. C.

One of the first steps affecting the drainage of the city was the construction of the Washington Canal from the Potomac River at the foot of Seventeenth street, west, to the Eastern Branch at the foot of Second street, east, authorized by an act of Congress of May 1, 1802.

This canal was purchased by the city under the authority of an act approved January 3, 1831, and was used for commercial purposes until it was filled, between the years 1871 and 1880. The sewers constructed by the city prior to 1871 emptied into this canal, and as it occupied through a greater part of its course a natural valley, it thus became the trunk drain for the central section of the city.

After the introduction of the Potomac water supply, in the year 1859, the demand for, and the construction of, sewers increased, and it was not long before complaints were made of the nuisance caused by the foul material brought to the canal by these sewers; and in 1871 the filling of the canal was determined upon.

When the canal was filled, its place as a drain and filth carrier was taken by the B street and Tiber sewers, emptying respectively into the Seventeenth-street canal and the James Creek Canal.

The sewers first constructed were intended to carry storm water, subsoil water, and liquid sewage, the discharge of any solids into the sewers being prohibited by law, and it was not until the act of the legislative assembly of August 21, 1871, that the solid constituents of sewage were allowed to be discharged into the sewers, although in point of fact water-closets with direct sewer connections were in use many years prior to the passage of this act.

By an "act of the legislative assembly of June 26, 1873," the cities of Georgetown and Washington were divided into sewerage and drainage sections, and under the direction of the "board of public works" the construction of the sewerage and drainage systems, therein outlined and provided for, was undertaken and a considerable portion of the same was completed when the board of public works was abolished, in 1874.

Under the form of government by Commissioners, the systems of sewers commenced by the board of public works were extended, and many of the main sewers were relieved by intercepting systems, the most important being the northeast boundary, the northwest boundary, the Q street, and the New York avenue systems.

At the present time the sewage of Washington and Georgetown is discharged into the river by the way of Rock Creek, the Seventeenth-street Canal, James Creek Canal and a small amount directly into the river by several independent outlets.

The discharge of sewage into the river by these direct outlets does not, at the present time, in any case constitute a nuisance, because, having in each instance a normal flow sufficient to overbalance the tidal prism, they maintain a constant outward flow insuring the discharge of the sewage into fresh river water before it has had time to become offensive.

The discharge of the sewage from 1,028 acres of the northwest section of the city and of Georgetown into the Rock Creek, with its small low-water discharge and irregular bed and course, is a prolific source of complaints, and in warm weather it is a decided nuisance which must affect the vitality of those residing within its influence.

The Seventeenth-street canal receives the sewage from 920 acres situated in the most densely-built up section of the city. This sewage is collected by the B-street sewer, commencing at Seventh street, west, the bottom of which is 2.97 feet below mean high water in the river and extending westward a distance of 5,200 feet to the point of discharge into the canal. This sewage is not conveyed promptly into the river, but decomposes in the sewer and canal, making this locality very offensive.

The James Creek Canal receives the sewage from 1,590 acres of territory not very densely built upon, but which is growing rapidly. This sewage is collected by the Tiber sewer, the bottom of which at Pennsylvania avenue is 3.64 feet below mean high water in the Potomac River, and the sewage is discharged into the James Creek Canal at G street, south. The condition of the sewage in this canal resembles that in the Seventeenth-street canal and like that it is in warm weather a nuisance which must affect the health of those who live or labor near it.

The distance in sewer and canal through which the sewage (retarded by tidal effect) must travel to reach the river is for the B-street area 2,400 feet and for the Tiber area 11,800 feet.

The condition of affairs existing as above stated and which should be radically improved upon, leads naturally to a consideration of the subject of the best method of sewage disposal for Washington.

The water-carriage system having been adopted, the four methods of disposal to be considered are: Broad irrigation, intermittent downward filtration, precipitation, and crude discharge into deep water.

BROAD IRRIGATION.

The use of land for the purification and utilization of the fertilizing elements of sewage has been proposed for many years, and many communities have endeavored to reap the profits they could readily perceive in it, but the results of these practical experiments demonstrate the fact that profit should not be expected in the disposal of this waste product, the removal and purification of which is of the utmost importance to health and comfort. The principal features of this plan consist of an arrangement of main feeders with ditches or carriers of such slopes as will distribute the sewage over the whole surface uniformly, the purification being effected by the vital action of the growing crop, and by the action of the oxygen of the air met with in the soil and while the sewage is distributed in a thin sheet upon the surface of the ground. After passing over the surface of the ground the then purified liquid is collected by effluent carriers and discharged into the most available water course.

The amount of land required for this purpose within reasonable limits would seem to be gauged by the quantity of sewage rather than by the amount of noxious constituents contained therein, or, in other words, the amount of the principal element in all sewage, viz, water, determines the amount of land required. The final report upon the metropolitan sewerage discharge (London, 1884) assumes that one acre of land is required for each one hundred persons contributing sewage, and as the amount of water used in Washington as compared with London is at least double per capita, we would require an acre of land for each fifty persons.

Assuming that a population of 500,000 persons must be provided for, the amount of land required will be 10,000 acres.

This amount of land of proper character, appropriately situated, can not be found within the limits of the District of Columbia, and the expense of pumping sewage to suitable land outside the District would be found too great for consideration.

INTERMITTENT DOWNWARD FILTRATION.

Instead of using land for the purpose of cultivating crops and irrigating the same with sewage, its use as a filter has given satisfactory results and has enabled a smaller amount of land to effect the purification of sewage than would be required by the process of broad irrigation. The soil for this purpose must be porous and it must be underdrained in order that the effluent may be promptly removed, and the sewage must be applied intermittently in order that the voids may be drained of sewage and filled with air between periods of application of sewage, the purification being effected by the action of the oxygen of this air upon the sewage. This process requires one-tenth of the amount of land required by the process of broad irrigation; therefore for the purpose of purifying sewage from 500,000 persons the amount of land required will be 1,000 acres. Land of suitable character and amount can be found in the valley of the Eastern Branch of the Potomac River, so this method of disposal is an entirely practicable one for Washington.

PRECIPITATION.

A method of effecting partial purification of sewage used in many places is that of adding chemicals to the sewage and passing it through tanks for the purpose of precipitating the solids. The precipitation being accomplished by allowing the treated sewage to remain quiescent in the tanks for a short time after each is filled or by passing the treated sewage through a series of tanks with very small velocity. After precipitation the effluent is discharged into the most available water course either directly or after passing it through land for the purpose of still further purifying it by oxidizing its soluble nitrogenous constituents.

This process may be said to be one for the purpose of reducing the noxious elements of sewage to a point that would make allowable its discharge into a water course which has not sufficient volume for oxidizing it as crude sewage. Lime, salts of alumina and of iron are the chemicals most used for precipitating sewage. The disposal of the precipitated material, a semifluid substance usually called "sludge," is one of the principal difficulties attending this process. It may be piled up so that the greater amount of water contained in it will drain off, the partially dried material being removed by carts, to be used as a fertilizer, as at Leeds, England. It may be dug into the ground allotted for that purpose, as at Birmingham, England. It may be discharged into barges and transported to sea, as proposed at Barking, England, or it may be pressed into cakes and disposed of as an artificial guano. In many

places the disposal of the sludge is effected with great difficulty, as no matter how well it may be prepared for transportation the farmers will not use it, and its accumulation at the precipitation works causes much complaint. The removal by barges to the sea would seem to be the only method of disposal whereby nuisance from the disposal of the sludge would be surely obviated.

The method of semipurification of sewage by precipitation is one which may be found useful in the future treatment of the sewage of Washington.

DISCHARGE OF CRUDE SEWAGE INTO DEEP WATER.

This method of sewage disposal is obviously the simplest and least expensive one if the outlets can be so located that long lines of main sewer are unnecessary, and if purification of the sewage can be effected thereby without causing local nuisances.

The Potomac River, below the Great Falls, is not used as a source of water supply, therefore it is not necessary to require in that portion of the river the same exalted degree of purity which would be necessary if water was supplied to communities therefrom. Under such circumstances it is assumed that the minimum quantity of water which should be allowed for the purification of sewage is 1,500 gallons per head of population per day.

The watershed of the Potomac River above Washington contains an area of about 12,000 square miles. The absolute minimum discharge is about 695,000,000 gallons per day; the minimum low season discharge being about 1,273,000,000 gallons per day. Upon the basis of a population of 500,000 to be served, the absolute minimum discharge would afford a dilution of 1,390 gallons, and the minimum low season discharge a dilution of 2,546 gallons per head per day. When it is considered that the periods during which the absolute minimum discharge occur are of short duration, and are of rare occurrence, it would seem safe to assume that the river may be depended upon to purify the crude sewage of Washington and Georgetown until the 500,000 limit of population is reached, which will be probably between the years 1930 and 1940, and it would seem unnecessary at the present time to make provision for a larger population.

In order that local nuisances may be obviated, the position of the outfalls becomes an important subject for consideration and an expensive series of float observations was projected, but the unfavorable weather of the last season causing an interruption of this work, and the lapse of the appropriation for this general object prevented the completion of the contemplated observations. The observations taken are of value for the purpose of showing the important effect of the wind upon the surface of the river, and they suggest the necessity of screening the sewage before discharge, and also that the sewage should be discharged at a considerable depth below the surface of the water.

The location of the points of discharge will be considered with reference to the Potomac River and Eastern Branch, considering the effect of each of these streams upon the other.

The Potomac River above the city is confined within a narrow channel and near the Chain Bridge, three miles above the city, it becomes affected by the tides. Further down the stream a point is reached, where by a balance between the fluvial discharge and the water backed up by the flood tide, the water neither flows up stream nor down stream during the time of the maximum effect of the flood tide. This point varies with the discharge and the tidal effect, but usually it is located not far from Easby's Point, below which the tidal basin increases in width and area.

Upon the southeast flank of the city is located the Eastern Branch of the Potomac River, which, draining a small water shed, has a small fluvial discharge, and opposite the city it has a large area for the storage of tidal water, so that during the flood tide there is a strong upward current which tends to carry the sewage discharged from the James Creek Canal eastward along the shores of the city between Greenleaf Point and the Navy Yard. At certain stages of the tide the current flowing downward in the Virginia channel and upward below the junction of the rivers, and in the Eastern Branch causes the waters from the Virginia channel to turn into and go up the Eastern Branch. This effect is augmented in the summer by the prevailing southerly winds.

This condition would seem to indicate that sewage should not be discharged into the Eastern Branch, and that the points of discharge should be removed as far as practicable from the junction of the rivers. If the sewage could be discharged into the river at a point about a mile above the Chain Bridge, the effect of the steep slope of the river with its rocky bed in this portion of its course would seem to insure a speedy dilution and oxygenation of the sewage. Again, the point of discharge might be situated so far below the city that the sewage would not return upon the flood tides. Either of these points of discharge would require all of the sewage to be pumped through long lines of conduits at a large original cost, and entailing a large annual expenditure. Instead of either of these expensive outlets, I propose that the

greater portion of the sewage be discharged near Easby's Point, the practically constant downward current existing there, insuring an effectual dilution of the sewage. The sewage at present discharging into Rock Creek is to be intercepted by a sewer practically parallel with Rock Creek with overflows in order that during storms the very dilute sewage will still be carried by the creek.

Another intercepting sewer is proposed from F and North Capitol streets along F street to Fifteenth street to E street; thence across the White Lot to C street; thence to New York avenue and to Easby's Point, with branches intercepting the sewage from the north slope of Capitol Hill, from the main sewer in G street, northeast, and from the North Capitol street sewer.

This sewer will be of such capacity that the surface drainage between F street and New York avenue and Seventh and Fifteenth streets, as well as the surface drainage from the area drained by the New York avenue sewer and the area draining to the sewer line between Fifteenth street and Easby's Point will be carried, thereby relieving the B street sewer, which is not of capacity sufficient for the duty imposed upon it.

A third main intercepting sewer will skirt the shores of the Eastern Branch, commencing not far from Fifteenth and F streets, northeast, and ending in the upper portion of the Arsenal grounds, where will be located a pumping station containing machinery necessary to lift the sewage to be brought by a fourth main intercepting sewer, which will drain the sewers situated in the low, level district of the city.

A fifth intercepting sewer, following practically the Washington channel, will drain by gravity a large portion of South Washington. From the pumping station, an outfall sewer, passing under the Washington channel by a syphon, will be constructed, the discharge end to be located a short distance below the Long Bridge.

This scheme will provide two main points for the discharge of the sewage, and does not take into consideration the main Georgetown sewer which now discharges without causing offense into deep water near the foot of Potomac street. I consider that the sewage will be more quickly diluted and diffused by the discharge from the points selected than if it were discharged into the river at any one point opposite the city. The only objection to this method of discharge is that, if in the future the growth of the city demands partial purification of the sewage before its discharge, then either these outfalls must be connected or two precipitation plants must be provided. As in such a case the sewage would require to be pumped, the cost of connecting the outlets would not be very great.

The consideration of the subject of the disposal of the sewage from the low districts, must take into consideration the subject of the disposal of the drainage from the low districts, which is now discharged into the river by way of the B street and Tiber sewer systems. The elevation of the surface, over a large portion of the B street and Tiber drainage areas, is below the elevation reached by the river during freshet stages, and the water flows upon, and floods the streets and private properties, causing material damage to public and private interests.

Two solutions of this problem suggest themselves, one of which is to raise the streets and private properties within this district to an elevation above that reached by the river during maximum freshet stages.

The other solution is to prevent access by the river to this district during the freshet stages. An estimate of the cost of raising the street above freshet elevation was recently prepared, the amount being \$2,020,694. If we add for cost and damage to private properties an equal amount, the total cost of this work will be \$4,041,388.

If this district is raised, the flooding of the streets during freshet in the river will be prevented, and where private properties are provided with efficient backwater sewer valves, the cellars will be preserved in a large measure from the effect of the water backed up by the sewers.

In order that access by the river to the low district during freshet stages may be prevented it will necessary to construct dikes on such lines along the river front that the river will not reach the low district. This will involve the use of pumping machinery to raise and discharge into the river the storm water of this area, and as it will be necessary to pump the sewage of this area, the question would be to so add to the capacity of the machinery at the pumping station that the drainage may be provided for.

In order that the low drainage area may be reduced as much as possible, the drainage of the Tiber and Indiana avenue sewers near their junction may be intercepted and carried by a conduit by way of Arthur street, the Capitol Grounds, Delaware avenue, Canal street, and New Jersey avenue to the Eastern Branch. This reduces the low-drainage district to 1,200 acres, the rainfall upon which must be raised by the pumping machinery. This scheme also requires the construction of a conduit to carry the surface drainage from the B street area to the Tiber sewer, a conduit from the Tiber sewer to the pumping station, and the reconstruction of the bottom of the Tiber sewer, in order that proper depth and gradient may be secured.

The constructions outlined and their operation will cause a lowering of the subsoil water in the low district with the resulting improvement of sanitary condition.

This general project has been brought to the attention of the sewage commission appointed under authority of a provision in the District appropriation bill for the fiscal year 1889-'90, and they have prepared estimates of the cost of this project as well as of others presented for their consideration, and these estimates will no doubt be submitted with their report upon the sewerage of Washington.

I respectfully transmit a general plan of sewers proposed and an appendix containing notes of sewerage works abroad.

Very respectfully,

D. E. McCOMB,
Superintendent of Sewers.

The ENGINEER COMMISSIONER, DISTRICT OF COLUMBIA.

APPENDIX.

In June, 1889, visits were made to some of the more important sewage works in England and to the Paris sewage works, and during these visits notes were taken, of which I make a résumé, as follows:

Liverpool.—Sewers carry both sewage and rainfall which is discharged continuously into the Mersey by independent outlets located to serve conveniently the districts drained. The fluvial low-water discharge of the Mersey has not been determined. The tidal range is 20 to 31 feet. The population is estimated at 750,000. No complaint of river pollution has ever been made. The general plan of drainage of the city locates the lateral sewers in the alleys, thus affording rear drainage to the houses. The water supply is estimated at 20 gallons per day per head. The total length of sewers is 500 miles. All work of construction and repair is performed by day labor.

Manchester.—Population 400,000. A project for providing a sewer system has been adopted and preliminary steps looking into the construction of the same have been taken. The scheme proposes the precipitation of sludge by the addition to the sewage of lime and sulphate of alumina, and by its flow with small velocity through a series of tanks. The effluent is to be filtered on the intermittent plan through ground which has been underdrained, after which it is to be discharged into the Manchester ship canal. The mean discharge of the rivers Irwell, Irk, and Medlock, all of which discharge into the ship canal above the proposed precipitation and filtration works, is said to be 300,000,000 gallons per day. This canal will be required to carry also the effluent from Salford, and the districts adjacent to Manchester and Salford with a population estimated at 400,000.

Leeds.—Sewage treated 10,000,000 gallons daily. Sewage raised 18 feet by five centrifugal pumps. Precipitation effected by the addition to the sewage of milk of lime, after which it passes with small velocity through twelve tanks, the effluent from the last tank passing over a weir and into the river. While the effluent seems to the eye to be less impure than the river Aire, into which it was discharged, yet the purification effected by the treatment received was below the standard reached in other purification works visited. The sludge is carried by a system of 18-inch pipes to a sludge well from which it is pumped to a field adjoining the works where upon drying it is carted away by farmers to be used as manure. The day of my visit to the works was not a warm day (the thermometer being about 70) yet the odor from the sludge which the laborers were loading into the carts was quite offensive. The effluent had also a strong smell as of sewage. The manager of the works stated that the large amount of wastes from the chemical establishments added largely to the difficulties experienced in treating the Leeds sewage.

Birmingham.—Population 620,000. Sewage treated 16,000,000 gallons daily. Sewage is not pumped except from a very small area. Milk of lime is added to the sewage, which is then passed through tanks where sludge is precipitated. The effluent is then carried to the irrigation farms which are worked upon the broad irrigation plan, after which it is discharged into the river Tame. The sludge is raised about 20 feet above the surface of the ground by an elevator to a line of wooden carriers, from whence it flows into beds where it is deposited 12 to 15 inches thick in depth over the surface, and after drying (requiring about fourteen days of good weather) it is spaded into the ground, and the area thus enriched is sown with roots or grasses and in a short time the soil becomes pulverized and is irrigated the same as the rest of the farm. The sludge carriers are supported by trestles which admit the moving of the carriers to serve the various sections of the farm used for the disposal of the sludge, and which are in rotation served with the sludge, as above described. These beds receive a coating of sludge every three years, or thereabouts.

In the tanks directly in front of the conduits delivering the limed sewage, the heavy material, mainly road detritus, settle, and a line of railway is laid along this side of the tanks, a derrick car being used to hoist this material, which is carried by

cars to a spoil bank. The works appear to be well managed and no offensive odor is noticed at a distance of one-fourth of a mile from the farm. Italian rye grass and roots are raised; a dairy with seventy-five cows and a large piggery being maintained, all the animals being in prime condition.

The average quantity of lime used per day is 13 tons; sludge deposited per day, 371 cubic yards; area of land used for digging in a sludge from tanks, 40 acres; total area of sewage farm, 1,227 acres; capacity of precipitating tanks, 1,169,360 cubic feet. The farm and precipitating works are operated by the borough.

Leamington.—Population 26,000. The sewage, 800,000 gallons per diem, is pumped to a farm belonging to the Earl of Warwick, whose tenant irrigates the farm with the sewage sent by the borough paying a small annual rate for the same. The broad irrigation system is used and the effluent is discharged into the river Leam. A profitable dairy is maintained and all the animals seemed to be in good condition. No odor was appreciable about the farm when I visited it, yet during the warm and damp weather the odor is said to be quite disagreeable in the vicinity of the farm.

Wimbleton.—Population 25,000. Sewage treated per day 750,000 gallons; about one-sixth of the sewage is pumped. The sewage is treated with milk of lime and sulphate of alumina before passing to the tanks for the precipitation of the sludge. After precipitation the effluent is used to irrigate a farm of 75 acres before its discharge into the river Wandle. The sludge is compressed into cakes by filter presses and these cakes are sold to farmers. The effluent from the farm was apparently pure water, and its chemical analysis is said to indicate a high degree of purification. This farm yields a profit of from 300 to 400 pounds sterling per annum, not considering the interest upon the cost of the farm and works.

Kingston-on-Thames.—Population 35,000. Sewage treated per day 1,050,000 gallons. Sewage is pumped into eight tanks for precipitation, the chemicals (said to be ground charcoal, ground clay, alum, and blood) being added separately between the pumps and the tanks. The precipitation is effected by filling four of the tanks while the other four tanks are being emptied of effluent and sludge to be filled in their turn while the first four tanks are being emptied. The effluent is discharged into the river Thames and to sight and smell it appears to be pure water. The sludge is removed by the pneumatic process and is pressed into cakes by the filter presses; these cakes are dried in an oven after which they are pulverized and bagged for sale. A market is said to be found for the pulverized sludge at £3 10s. per ton.

Sheffield.—Population 315,000. Sewage treated per day 16,000,000 gallons. Milk of lime is added to the sewage before it reaches the tanks, which are filled and emptied in regular order, sufficient time being allowed for the precipitation of the sludge. The partially purified sewage from the tanks is allowed to flow over a broad sloping surface to the coke filter, passing upward through a layer of coke about 4 feet thick, and it is then discharged quite clear and apparently well purified into the river Don. The sludge is pumped by centrifugal pumps to a bed of slag and after draining is piled and removed by contract. The coke filter bed is renewed once in five months, the old coke being sprinkled with sulphate of iron and creosote and afterwards burnt in the furnaces at the works. Before reaching the liming station the sewage passes through a section of sewer much larger than the outlet sewer in which the grosser impurities are deposited. The lower end of this enlarged section is protected by a screen to catch light substances.

London.—Population about 4,500,000. The sewage is discharged into the river Thames at two points, that from the north side of the Thames, serving a population of 3,300,000, at Barking, 11 miles below London Bridge, and that from the south side of the Thames, serving a population of 1,200,000, at Crossness, 15 miles below London Bridge. The sewage is received in covered reservoirs at these points, and is discharged into the river during the ebb tides.

The mean daily summer discharge of the river Thames is about 380,000,000 gallons, falling sometimes below 324,000,000 gallons, the area of its watershed above Barking being not far from 6,000 square miles.

The dilution afforded by the fluvial discharge of the river during the low stage being about 7 gallons per head per day. The works at the Barking outlet for precipitating sludge from the sewage before its discharge into the river are nearly complete, and were visited in June last. It is proposed to add to the sewage 4 grains of lime and 1 grain of sulphate of iron before it is discharged into the settling tanks, which cover a superficial area of 9 acres. After the deposit of sludge the effluent is to be discharged into the old reservoir, to be discharged into the river upon the ebb tides. The sludge is to be pumped into an elevated reservoir, from which it will be deposited by gravity into barges, to be by them carried to and deposited into deep water at sea.

The precipitation works have a capacity for treating 90,000,000 gallons of sewage per day. The London sewage was discharged prior to 1863 into the river along the fronts of the city by sewers serving natural drainage districts, and for many years the nuisance caused thereby and the best method of disposing of the sewage were

subjects of controversy until the plan proposed by the engineers of the metropolitan board of public works was adopted in the year 1858.

This plan provided for intercepting the sewage and carrying it to Barking and Crossness, respectively, when it is discharged into the river upon ebb tides. The works contemplated were completed in the year 1865 at an expenditure amounting to \$23,000,000. These works were not many years in use before complaints were made of the pollution of the river from the sewage, and after investigations and Parliamentary inquiries, extending from the year 1868 to the year 1884, the precipitation of the sludge and the discharge of the effluent upon the ebb tides was decided upon and the works for the same are now nearly complete.

Coventry.—Population 50,000. Sewage treated per day, 235,000 gallons. The sewage is passed through a rotary screen to remove the greater impurities before arriving at the point of application of chemicals, which are sulphate of alumina and lime, the proportions being varied according to the judgment of the local manager of the works. The effluent is then filtered through the land upon the intermittent principle, but on account of the insufficient area of the filtered beds the effluent is discharged directly into the river Sherbourne without filtration between the hours of 12 midnight and 3 a. m. The sludge is compressed by means of filter presses, the hydro-pneumatic system being used for pumping the sludge.

Paris.—Population 2,500,000. Estimated amount of sewage 92,000,000 gallons per day. About 30,000,000 gallons of sewage per day is pumped at Clichy and sent to the irrigation farm, the remaining portion of the sewage being discharged into the river Seine below the city. The area of ground (which is increasing every year) now being irrigated is about 2,000 acres. The sewage does not contain a very large amount of solids, as these are to a large extent retained in cesspools before the sewage is taken into the public sewers, and no further precipitation of sludge is attempted before the sewage is sent to the sewage farm. The farms are usually laid off into beds by ditches which carry the sewage, which is absorbed by the earth as it passes along these ditches. The ground cultivated belongs (with the exception of a model farm belonging to the city) to private landowners, its character being of a fine sandy alluvium which irrigation has redeemed from a desert-like plain to become a fertile market garden. It is expected that it will not be long before a sufficient quantity of this land will be cultivated to demand all the sewage from Paris and thus preserve the Seine from its polluting effect. An objection to the method of the disposal by farmers who can use the sewage or not as each one thinks best, would seem to be that during wet weather and periods succeeding wet weather, a large portion of the sewage would be discharged into the river without being passed through the land. At such times, however, the amount of water in the river would probably be sufficient for the purification of the sewage thus discharged. The sewage is passed over the ground during the winter season when no crops are growing, the farmers claiming that the grounds thus become enriched for the ensuing season's crop. The effluent from the model farm at the time of my visit was remarkably clear and bright.

SPECIFICATIONS FOR STANDARD PAVEMENTS AND STREET CONSTRUCTION MATERIAL.

SPECIFICATIONS FOR GRANITE CURB.

6 BY 20 STANDARD GRANITE CURB.

The curb must be of good and acceptable texture and color, dressed straight down 12 inches on face, 3 inches on back, and chiseled 6 inches deep on joint, with no projection beyond the chiseled portion of the joint. The joints must be perfectly close fitting, cut at a true right angle to face and top. Joints which are at all open will not be accepted. The top will be beveled one-quarter of an inch. The face and top to be true plane surfaces, without bends, twists, depressions, cups, or other irregularities. The face must be cut to a perfectly true line, to be tested with a straight-edge. The angle between face and top to be well defined. The length must not be less than 6 nor more than 12 feet; depth not less than 20 nor more than 24 inches in any portion of a piece. The bed of the curb must not be less than 6 inches. No excessive protuberances on sides will be allowed.

SPECIAL 8 BY 8 GRANITE CURB.

The same specifications for special 8 by 8 curb will hold as above given for standard 6 by 20 curb, with the exception of dimensions and bed, which will be as follows: Width, 8 inches; depth, not less than 8 nor more than 10 inches. The bed will be rough dressed, to give a secure bearing.

CIRCULAR CURB.

Circular curb will conform in all respects to the above specifications, except as to lengths. By far the larger amount of circular curb will be cut to a 6 foot radius in lengths of 4 feet $8\frac{1}{2}$ inches, but the contractor must be prepared to cut to such radius and in such lengths as may be required.

SAMPLES.

Each bidder will submit a sample of his stone not less than 2 feet long, and all deliveries must conform to this sample.

GRANITE PAVING BLOCKS.

PLACE AND CONDITIONS OF DELIVERY.

Granite paving blocks will be delivered by the contractors in the property yards of the District of Columbia. These property yards will ordinarily be situated along the lines of railroad or river front and within 500 feet thereof. Sidings from all railroads entering the city run into property yards. Blocks will be so piled as the Engineer Commissioner or his agent may direct. The contractor will furnish all labor necessary in culling and assisting the inspector in counting and inspecting the blocks. Payment will only be made upon the count of the District inspector. All expenses attending unloading, piling, and culling will be borne by the contractor.

SPECIFICATIONS.

The blocks may be of any syenite or granite equal in quality to what is known as Quincy granite, of uniform fine grain and texture, without lamination or stratification, and free from excess of mica or feldspar. Soft or weatherworn stones from the surface of the quarry or stones that will wear smooth under traffic will not be accepted.

The blocks must be of the following dimensions, viz: In length, not more than 8 nor less than 6 inches; in width, not more than 4 nor less than 3 inches; in depth, not more than 6 nor less than $5\frac{1}{2}$ inches, and the average size shall be such that not more than 42 shall be required to lay a square yard of pavement. They must be sufficiently dressed to present rectangular faces, with straight edges on top, bottom, and sides, and all blocks whose faces vary more than half an inch from a rectangular shape will be rejected. The sides and ends of the blocks must be so dressed that they will make close-fitting joints, and any block which has a greater projection than half an inch will be rejected. Should block be delivered which run more than forty-two to the yard, a corresponding deduction will be made in payment.

PAVING AND ARCH BRICK.

SPECIFICATIONS.

Sidewalk paving bricks shall be of uniform size, $8\frac{1}{2}$ by 4 by $2\frac{1}{2}$ inches, hard burned throughout, without flaws or cracks, and square and true on edges. Arch bricks shall be of dimensions $8\frac{1}{2}$ by 4 by $2\frac{1}{2}$ inches, hard burned throughout, sound and true, and regular shape. No swelled bricks or soft or salmon bricks will be allowed. Specimens will be submitted with proposal, to which deliveries must conform. Proposals for bricks of a size different from those mentioned above will be received and comparison made with other bids, taking size into consideration; but in all cases the bricks furnished must be equal to sample submitted with proposal.

QUANTITY AND DELIVERY.

Bricks will be delivered along line of work, where they will be receipted for by a District employé or contractor, and these receipts must be presented with bills. It is estimated that there will be required 3,000,000 paving bricks and 250,000 arch bricks; but the right is reserved to vary these figures 25 per cent. Bricks will be delivered in such quantities as may from time to time be ordered. It is likely that 2,000,000 will be required before December 1. Failure at any time to deliver the required amount will be considered sufficient grounds for annulling the contract, as provided in paragraph 1 of general stipulations. For the convenience of out-of-town bidders

delivery may be made to a District property yard, situated contiguous to the railroads and river front. In such cases they will be properly piled in such manner and place as the Commissioners or their agent may direct. The contractor will furnish all labor necessary to assist inspector in inspecting and counting the bricks. All expense attending unloading and inspecting will be at expense of contractor. In comparing price of bricks delivered on line of work and bricks delivered in property yard, \$1.75 will be added to price per thousand of bricks delivered in property yard to pay cost of haul to place where used. Bricks delivered in property yard will be paid for upon count of District inspector.

ASPHALT PAVING BLOCKS.

SPECIFICATIONS.

The size of the blocks will be 4 by 5 by 12 inches, and a variation of one-fourth of an inch from these dimensions will be sufficient grounds for rejecting any block.

Blocks must be square and true on edges. Chipped and rough-edged blocks will be rejected.

The blocks will be composed of paving cement, 11 to 15 per cent.; crushed limestone, 89 to 85 per cent., of which about 50 per cent. shall be coarser than 20 meshes to the inch.

The paving cement will be an admixture of refined Trinidad asphalt with the residual oil obtained from the distillation of petroleum. No product of the distillation of coal tar will be permitted. The right is reserved to inspect the manufacture of the blocks at any time.

The blocks must be equal to any ever laid in the District and satisfactory in every respect to the Engineer Commissioner.

ASPHALT PAVING TILES.

The materials composing the tiles will be the same as for asphalt paving blocks.

The tiles will be of two sizes, square 8 by 8 by 2.5 inches and hexagonal 4.64 inches on the side and 8 inches between parallel sides and 2.5 inches thick.

Tiles must conform to specifications for blocks in all particulars excepting size.

QUANTITY AND DELIVERY.

It is estimated that there will be required 500,000 paving blocks and 250,000 tiles. These figures are approximate only, and the right is reserved to order such number of each of the above items as may be needed. Of paving tile, figures should be submitted for 50 per cent. hexagon, the remaining 50 per cent. square.

Delivery will be made to a District property yard, situated contiguous to the river front and railroad switches running from Pennsylvania and Baltimore and Ohio lines.

They will be piled in such manner and spot as the Engineer Commissioner or his agent may direct. The contractor will furnish such labor as is necessary to assist the District inspector in inspecting and counting the blocks and tiles. All expense attending unloading and inspecting (except pay of inspector during time of contract) will be borne by the contractor. Payment will only be made upon the count of the District inspector. It is desired to expedite the work of delivery as much as possible. Bidders will therefore specify the rate at which they can carry on the contract, and the successful bidder must conform to the rate mentioned in his proposal.

VITRIFIED PAVING BRICKS.

SPECIFICATIONS.

The bricks to be furnished must possess such qualities in regard to hardness, toughness, and durability as to especially fit them for use in paving streets, gutters, alleys, etc. Bricks will be 9 by 4 by 2.5 inches. Proposals for bricks of a smaller size will be considered, but an allowance will be made when compared with proposals for full-size brick. Bricks will be thoroughly hard, well and uniformly burned, and free from warps and fire cracks. Surfaces must be true and corners square. Samples must accompany each proposal, and all brick delivered will be strictly held to conform to such sample.

APPROXIMATE QUANTITY.

It is estimated that there will be required 400,000 bricks, but the right is reserved to increase or diminish the above amount 33 $\frac{1}{3}$ per cent. Ten days' notice will be given of such change. Bids for a smaller number than the above will be considered.

CONDITIONS OF DELIVERY.

Bricks will be delivered and piled in the District property yards in a manner satisfactory to the Engineer Commissioner or his agents. Such delivery and piling will be at the expense of the contractor, and the District will assume no responsibility before such piling. These property yards are situated contiguous to the railroads (switches running into same) and along river front. Bricks will be piled at such point as may be designated, the distance of hauling in no case exceeding 500 feet from siding. An inspector will be detailed, who will inspect and count all bricks delivered, and upon such count only will payment be made. All labor necessary for such inspection and count will be furnished by the contractor. Bidders will state when delivery can be made and rate at which it can be prosecuted. Time of delivery will be an essential element in awarding contract.

SPECIFICATIONS FOR LAYING COBBLE GUTTERS AND CROSSINGS.

The cobblestone and flagging will be furnished by the District on the line of work. This material will generally be furnished from other streets under improvement, but in case this can not conveniently be done, the contractor will bid a price for hauling such material to his work.

The materials necessary to be removed will be excavated to a depth of 12 inches below the top line of the proposed gutter or crossing when fully packed. Any objectionable or unsuitable material below the bed will be removed and the space filled with clean sand or gravel.

All holes or inequalities will be filled to a proper level with sand or gravel well compacted by rolling or ramming. Upon the foundation thus prepared will be laid a bed of good gravel, 5 inches in thickness, thoroughly compacted by rolling or ramming. Upon this will be spread a layer of clean, sharp sand, to serve as a bed for the paving stones, of such depth as may be required to bring the work to grade.

The cobblestones will be assorted as they are brought upon the ground, and no stones that are less than 4 or more than 6 inches long or less than 2 or more than 4 inches wide will be used, and the several sizes will be laid so as to make an even surface when rammed. When thus laid the stones shall be immediately covered with clean, fine sand, in proper quantities, and raked until the joints become filled therewith; the stones shall then be thoroughly rammed to a firm, unyielding bed, with a uniform surface and proper grade.

The foundation for the gutter and crossing flag shall be prepared in the same manner as described for cobble, upon which the flag will be laid with close joints and settled into place solidly in such manner as not to fracture the flag.

SPECIFICATIONS FOR SETTING GRANITE AND BLUESTONE CURB.

STANDARD GRANITE AND BLUESTONE CURB.

All curb will be furnished by the District at the property yard, and will be hauled at the expense of the contractor.

The trench will be dug 24 inches deep and 18 inches wide, to permit of thorough ramming. A bed of gravel 4 inches deep will be laid in the bottom of the trench, and thoroughly consolidated. On this bed the curb will be laid to level and grade, with close joints, and even and continuous surfaces.

The ditch will then be filled with gravel, the first filling to be not more than 3 inches deep, be well rammed by rammers or bars, so as to give the curb a solid bearing under its entire length. Other layers will then be rammed in the ditch to within 10 inches of the top of the curb; the layers for each ramming to be not more than 4 inches deep.

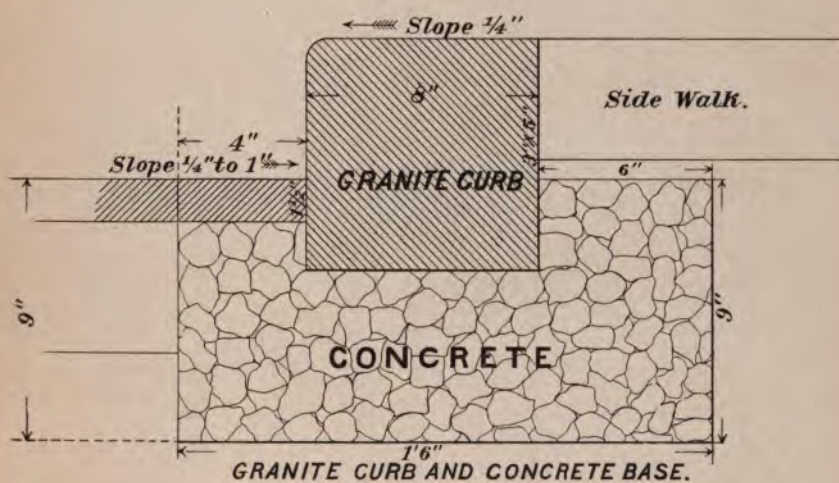
SPECIAL GRANITE CURB.

The special granite curb will be laid on a foundation of hydraulic concrete, as shown by the following drawing:

The bed will be prepared as prescribed for carriageway pavements. On this bed the concrete foundation will be laid, as prescribed for concrete base for standard asphalt pavements.

The curb will be laid before the concrete has set, so that it can be settled to a firm bearing and brought to proper grade.

If so desired, the contractor will be authorized to finish the foundation in front of the curb with a layer of binder, as prescribed for the intermediate course in coal-tar distillate pavements, but no extra allowance will be made for such work.



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SPECIFICATIONS FOR COMBINATION CURB AND GUTTER.

A combination curb and gutter of artificial stone on a concrete foundation will be laid on streets as may be ordered by the Engineer Commissioner.

The curb, gutter, and foundation will conform with the dimensions given on drawing on file in engineer department.

The concrete foundation will be composed of the same materials, and will be laid in the same manner as prescribed for concrete foundations of asphalt pavements.

The curb and gutter will consist of fine concrete, composed of one part Portland cement, two parts clean, sharp sand, and three parts clean broken stone, not more than 1 inch in their largest dimensions.

The exposed surfaces of both gutter and curb will be coated $1\frac{1}{2}$ inches thick with a cement composed of three parts granulated granite (the fragments being of such size as to pass through a quarter-inch screen and free from all dust) and two parts of cement.

The cement used in the manufacture of the curb and gutter must conform to the current District of Columbia specifications for slow-setting Portland cement.

The work will be carried on uniformly, and the whole curb completed while in a soft and plastic state, so that it will become a homogeneous solid when set.

While still plastic, the curb and gutter will be saw cut at intervals of 8 or 10 feet, as may be ordered, to allow for expansion and contraction and to give the appearance of cut stone.

Contractors may use such methods of molding the curb into shape as they may deem best fitted to the work. The curb and gutter when set must conform with the cross-section shown in drawing.

A conduit for electrical conductors, 4 inches wide and 4 inches high, will be left at the base of the curb if so ordered by the Engineer Commissioner. Hand-holes, to give access to this conduit, will be left at intervals of 50 feet, more or less, as may be ordered, all as shown on drawing. Manholes will be constructed near each cross street in accordance with plans and specifications on file in the Engineer Department. The exact location of each manhole will be fixed by the Engineer Commissioner, District of Columbia. The cost of these man and hand-holes, and their frames and covers, must be included in the price per linear foot of the "combination curb and gutter with electrical conduit."

The curb and gutter must be properly protected from injury while setting, and the material used for such protection must be removed within twenty-one days from the completion of the work, if so ordered.

The contractor is required by law to guaranty all work for the period of five years from the date of the completion of the contract.

SPECIFICATIONS FOR LAYING SIDEWALKS.

BRICK OR TILE SIDEWALKS.

Brick or tile pavements will be laid on a foundation of gravel and sand. The brick and tile will be furnished by the District, the brick delivered on the line of the work, and the tile at the property yards, and hauled to the work by the contractor; the cost of hauling to be included in the price bid.

For brick sidewalks the space over which the pavement is to be laid will be excavated to the depth of 10 inches below the top surface of the proposed pavement, when thoroughly compacted by rolling or ramming. Any objectionable or unsuitable material below the bed will be removed, and the space filled with clean gravel or sand. Care must be taken in excavating to preserve the proper slope, parallel with the surface.

Upon the foundation will be laid a bed of fine bank gravel 4 inches in depth when compacted, screened from all pebbles measuring more than $1\frac{1}{4}$ inches in their largest dimensions, and thoroughly rolled or rammed. Upon this will be laid a bed of fine sharp sand, washed and dried, 4 inches in thickness, to serve as a bed for the blocks, which will be laid directly upon and embedded in it with close joints. Special care will be observed to make the surface of this bed of sand parallel to the surface of the pavement when finished. The bricks must be laid by the pavers standing or kneeling upon the bricks already laid, and not upon the bed of sand.

For tile sidewalks the foundation will be prepared as for brick sidewalks, excepting that the sand on which the tiles are laid shall be 2 inches in thickness, as they do not admit of as heavy ramming as brick sidewalks, and the surface shall be covered with equal parts of fine dry sand and dry hydraulic cement, thoroughly swept into the joints, and the surplus swept off.

The bricks or tiles are to be laid at right angles with the line of the street, or in herring-bone style, as may be directed by the Engineer Commissioner, and even with

the top of the curb when rammed; each course to be of bricks of a uniform width and depth, and so laid that all longitudinal joints shall be broken by a lap of at least 2 inches. Each course will be driven against the course preceding it by a maul, to make tight joints. When thus laid the bricks will be immediately covered with clean, fine, dry sand, free from loam or earthy matter, and screened through a sieve or screen having not less than 20 meshes to the inch. The bricks will then be carefully rammed by placing a plank over several courses, and ramming the plank with a heavy rammer. The ramming will be continued until the bricks reach a firm, unyielding bed and present a uniform surface, with proper grade and slope. Any lack of uniformity in the surface must be corrected by taking up and relaying. When the ramming is complete a sufficient amount of fine, dry sand, as above described, will be spread over the surface and swept or raked into the joints.

Rectangular spaces 7 feet by 3 feet in dimensions, will be left unpaved around trees where already planted, and at intervals of 25 feet between centers adjacent to the curb on streets where trees have not been planted. When so ordered, a continuous tree space 4 feet wide will be left unpaved adjacent to the curb.

Edges of brick pavements, when not abutting against the curb, will be finished with a continuous row of brick on edge.

ASPHALT SIDEWALKS.

The asphalt sidewalk will be 1 inch thick when compacted, with a base of hydraulic cement-concrete 3 inches in depth.

The space over which the pavement is to be laid will be excavated to the depth of 4 inches below the surface of the proposed pavement when thoroughly compacted by rolling or ramming. Any objectionable or unsuitable material below the bed will be removed and the space filled with clean gravel or sand. Care must be taken in excavating to preserve the proper slope parallel with the surface of the pavement.

Upon this foundation will be laid a bed of hydraulic cement-concrete 3 inches in thickness, to be made as follows: One measure of cement, which shall fulfill the current cement specifications of the District, and two of clean, sharp, washed sand, free from clay, will be thoroughly mixed dry and made in a mortar with the least possible amount of water; broken stone not exceeding $1\frac{1}{2}$ inches in their largest dimensions, thoroughly cleaned from dust and dirt, drenched with water, but containing no loose water in the heap, will be incorporated immediately with the mortar in such quantities as will give a surplus of mortar when rammed. This proportion, when ascertained, will be regulated by measure. Each batch of concrete will be thoroughly mixed, the mixing being continued on the board until each piece of stone is completely coated with mortar; it will then be spread and at once thoroughly compacted by ramming until free mortar appears upon the surface. The whole operation of mixing and laying each batch will be performed as expeditiously as possible, with the use of a sufficient number of skilled men. The upper surface will be made exactly parallel with the surface of the pavement to be laid, and will be protected from the action of the sun and wind until set.

The wearing surface will be composed of the same material and manufactured in the same manner as that laid upon carriageways, and will be laid in the same manner, to have a thickness of 1 inch when compacted 40 per cent. The surface will be compacted by tamping irons and hand rollers. It will be finished by sweeping dry hydraulic cement over its surface and cross rolling.

Rectangular spaces 7 feet by 3 feet in dimensions will be left unpaved around trees where already planted, and at intervals of 25 feet between centers, adjacent to curb, on streets where trees have not been planted. When so ordered a continuous tree space 4 feet wide will be left unpaved adjacent to the curb.

Where the pavement is next to the curb or wall hot asphalt will be poured into the joints and the pavement will be coated 3 inches therefrom with hot asphalt and smoothed with hot smoothing irons in order to make the joints impervious. Where the pavement does not abut against a curb or wall, a strip of board 1 inch thick, reaching to the bottom of the pavement, will be used as a curb, made flush with the surface of the pavement.

ARTIFICIAL STONE SIDEWALK.

The artificial stone sidewalk will be 1 inch thick, with a base of hydraulic cement-concrete 3 inches in depth.

The bed of the sidewalk beneath the base will be prepared in the same manner as for asphalt sidewalks.

The base will be prepared in the same manner and with the same kind of material as that for asphalt sidewalks.

Upon this base the wearing surface will be laid 1 inch in thickness; it will be composed of one part of Portland cement and one part of sand. The cement must be in accordance with the current District of Columbia specifications. The cement will be

tested daily. The sand must be of such size as will pass a No. 20 screen, and must be sharp, siliceous, and free from aluminous and all other foreign substances.

The matrix of the wearing surface will be made as follows: The cement and sand will be thoroughly mixed, dry, and a sufficient quantity of water afterwards added to form a paste of proper consistency; it will be expeditiously mixed by skilled men; none of it will be used after it has been mixed one-half hour, or evidences of setting are apparent.

The water used must be fresh and clean.

The wearing surface will be laid upon the base, of 1 inch in thickness, with a uniform plane surface properly smoothed. It will be cut into diamonds or diagonal slabs of such size as shall be directed.

The wearing surface will be protected from the action of the sun and rain until it is thoroughly set.

Rectangular spaces, 7 feet by 3 feet in dimensions, will be left unpaved around trees, where already planted, and at intervals of 25 feet between centers, adjacent to the curb, on streets where trees have not been planted. When so ordered a continuous tree space 4 feet wide will be left unpaved adjacent to the curb.

Where the pavement does not abut against a curb or a wall, a strip of board 1 inch thick, reaching to the bottom of the pavement, will be used as a curb, made flush with the surface of the pavement.

ARTIFICIAL BLOCK SIDEWALKS.

The contractor shall remove all stone, plank, bricks, or other materials of value from points where the sidewalks are to be laid as the work progresses, and shall haul them to the nearest property yard or otherwise dispose of them as the Engineer Commissioner may direct. Care shall be taken at all times not to interfere with business or travel more than is absolutely necessary for the faithful performance of the work. No more than 100 feet shall be closed to travel at any one time, nor remain closed for a longer time than three days, and free ingress and egress from the streets to all stores and hallways shall be provided for at all times; and during the time that travel is closed at any point the contractor shall provide a temporary walk, said walk to be at all times in condition perfectly safe for pedestrians and easy of access from adjoining walks.

The contractor shall make such cutting and filling as may be necessary to bring the foundation to the subgrade, 6 inches below the established grade of the sidewalk.

Whenever the Engineer Commissioner or inspector may deem it necessary the foundation shall be consolidated by wetting, rolling, or ramming, to give it proper stability. Upon the foundation thus prepared there shall first be laid 3 inches of concrete, composed of one part natural hydraulic cement, two and one-half parts sand, and five parts broken stone, which shall be rammed in place to the satisfaction of the Engineer Commissioner. On this concrete bed shall be laid three-quarters of an inch of mortar, composed of four measures of clean, sharp sand and one of Portland cement, which shall be put in as dry as possible and rammed in place with an iron rammer, weighing at least 25 pounds. Upon the foundation thus prepared shall be laid square blocks of tiles $2\frac{1}{4}$ inches thick, measuring 18 inches on a side. They shall be laid so as to present a true surface on top and conform to the exact grade of the sidewalk. A thin grouting of pure Portland cement of the best quality shall be spread over the surface and carefully swept into the joints. All superfluous groutings shall be cleaned off, and the walk shall be protected with plank or otherwise until the cement has thoroughly set.

Driveways shall be laid with granite or asphalt blocks, as may be directed by the Engineer Commissioner.

The tiles shall be $2\frac{1}{4}$ inches thick. The lower $1\frac{1}{4}$ inches to be composed of one part Portland cement (equal to that specified in current District of Columbia specifications) and two parts of clean, sharp sand, thoroughly mixed, using as small a quantity of water as possible, and carefully rammed into the molds. The upper one-half inch and the sides for one-half inch shall be composed of one part Portland cement of same quality as above, and one part of clean, sharp sand. The surface shall be finished smooth, but not polished. The tiles, when being seasoned, shall be kept wet for the first five days. No tiles shall be used on the work unless guaranteed by the contractor to be at least thirty days old. Unless otherwise ordered, the edge of the sidewalk shall be finished with plastering of Portland cement and sand of equal parts. The blocks will be laid with their edges perpendicular to or parallel with the line of the street, as may be ordered by the Engineer Commissioner.

Cement inspection.—No cement shall be used on this work unless approved by the Engineer Commissioner. For this purpose he shall be entitled to take one-half pound from each package. The decision of the Engineer Commissioner shall be final in all cases, and no cement condemned by him shall be used on the work for any purpose whatever. All cement will be required to pass the tests specified in current District of Columbia specifications.

SPECIFICATIONS FOR LAYING STREET PAVEMENTS.

STANDARD ASPHALT PAVEMENT.

The attention of bidders is invited to the clause of the appropriation bill which says:

"That under appropriations contained in this act, no contract shall be made for making or repairing concrete or asphalt pavement at a higher price than two dollars and twenty-five cents per square yard for a pavement with hydraulic base and two dollars per square yard for a quality equal to the best laid in the District prior to July first, eighteen hundred and eighty-six, and with same depth of base."

Standard asphalt pavement will be $2\frac{1}{2}$ inches in thickness when compacted, with a base of hydraulic cement concrete 6 inches in depth.

The space over which the pavement is to be laid will be excavated to the depth of 8 $\frac{1}{2}$ inches below the top surface of the pavement when completed. Any objectionable or unsuitable material below the bed will be removed, and the space filled with clean gravel or sand well rammed. The bed will then be trimmed so as to be parallel to the surface of the pavement when completed, and the entire roadbed will be thoroughly rolled with a heavy steam roller.

Upon this foundation will be laid a bed of hydraulic cement-concrete 6 inches in thickness, to be made as follows:

One measure of hydraulic cement and two of clean, sharp, washed sand, free from clay, will be thoroughly mixed dry and made into a mortar with the least possible amount of water; broken stone of acceptable dimensions and character, thoroughly cleaned from dust and dirt, drenched with water, but containing no loose water in the heap, will be incorporated immediately with the mortar in such quantities as will give a surplus of mortar when rammed. This proportion, when ascertained, will be regulated by measure. Each batch of concrete will be thoroughly mixed, the mixing being continued on the board until each piece of stone or brick is completely coated with mortar; it will then be spread and at once thoroughly compacted by ramming until free mortar appears upon the surface. The whole operation of mixing and laying each batch will be performed as expeditiously as possible, with the use of a sufficient number of skilled men. No gravel will be used in the concrete, but only angular fragments of stone having rough faces obtained by fracture, and measuring not more than $1\frac{1}{4}$ inches in their largest dimensions. The upper surface of the base will be made parallel with the crown of the pavement to be laid, and will be suitably protected from the action of the sun and wind until set.

The cement used must conform to the current District of Columbia specifications, and shall in no case be used until sufficient tests have been made to prove this. A sample sufficient for test shall be furnished from each barrel.

The wearing surface will be composed of, (1) refined Trinidad or other acceptable asphaltum; (2) heavy petroleum residuum oil; (3) fine sand, containing not more than 5 per centum of loam or clay; (4) fine stone dust; (5) fine powder of carbonate of lime.

The asphaltum must be refined under the direction and to the satisfaction of the Engineer Commissioner. The asphaltum must not be inferior in any respect to the best in use during the past year in the District, as shown by its chemical composition and physical characteristics. Should the contractor desire to use any asphalt different from that now being used, he shall demonstrate to the satisfaction of the Engineer Commissioner that it is as good, or better.

The residuum oil must be free from coke or excess of light oil or hard paraffine, and of a specific gravity of from 18 to 22 degrees Baume and withstand a fire test of 250° Fahrenheit.

The refined asphaltum and residuum oil will be mixed in the following proportions by weight:

With Trinidad asphalt—

	Parts.
Asphalt.....	100
Petroleum	17 to 20

Samples of asphalt cement shall be furnished daily to the inspector of asphalt and cements, in suitable tin boxes, from the dipping kettles and from the oiling stills.

The proportion of mixture for other asphalts will be determined by their chemical composition.

The asphaltic cement, made in the manner above described, will be mixed with other materials in the following proportions by weight, viz:

Asphaltic cement.....	from 13 to 16
Sand.....	from 63 to 58
Stone dust.....	from 28 to 23
Pulverized carbonate of lime	from 3 to 5

The proportion of materials used will depend upon their character and the traffic on the street, and will be determined by the Engineer Commissioner, but the percentage of bitumen in any mixture soluble in carbon bisulphide shall not exceed the limits, 9 to 11 per cent. If the proportions of the mixture are varied in any manner from those specified the mixture will be condemned; its use will not be permitted; and, if already placed on the street, it will be removed and replaced by proper material at the expense of the contractor.

The mixture of sand and stone dust and the asphaltic cement will be heated separately to about 300° Fahrenheit. The pulverized carbonate of lime, while cold, will be mixed with the hot sand in the required proportions, and then mixed with the asphaltic cement, at the required temperature and in the proper proportion, in a suitable apparatus, so as to effect a thoroughly homogeneous mixture. Sand boxes and tar and asphalt gauges will be weighed in presence of inspectors as often as may be desired.

The pavement mixture prepared in a manner thus indicated will be laid on the foundation in two coats. The first coat, called cushion coat, will contain from 1 to 2 per cent. more asphaltic cement than given above; it will be laid to such depth as will give a thickness of 1 inch after being consolidated by a roller. The second coat, called surface coat, prepared as above specified, will be laid on the cushion coat; it will be brought to the ground in carts, at a temperature of not less than 250° Fahrenheit, and if the temperature of the air is less than 50° the contractor must provide canvas covers for use in transit. It will then be carefully spread, by means of hot iron rakes, in such manner as to give uniform and regular grade, and to such depth that, after having received its ultimate compression of two-fifths, it will have a net thickness of 2 inches. This depth will be constantly tested by means of gauges furnished by the Engineer Commissioner. The surface will then be compressed by hand rollers, after which a small amount of hydraulic cement will be swept over it, and it will then be thoroughly compressed by a steam roller weighing not less than 250 pounds to the inch run, the rolling being continued for not less than five hours for every 1,000 yards of surface.

All materials used, as well as the plant and methods of manufacture, will be subject to the inspection and approval of the Engineer Commissioner.

The degree of fineness, both of sand, stone dust, and powdered limestone, will be determined by testing with screens, as follows: The powdered carbonate of lime will be of such degree of fineness that 16 per cent. by weight shall be an impalpable powder of limestone, and the whole of it shall pass a No. 26 screen. The sand will be of such size that not more than 50 per cent. of it will pass a No. 80 screen. The broken stone or stone dust shall be the residue from the crushing of stone from the base and binder which passes a sieve of not more than 6 meshes to the inch.

Gutters, wherever directed, will be granite block or brick of such width as may be directed, laid upon a hydraulic base of not less than 4 inches in thickness, in accordance to specifications for granite block pavement.

Where gutters are not paved with granite blocks or bricks, they will, for a width of 1 foot, be painted with No. 4 paving tar, and ironed with hot smoothing irons.

After the curb is set and pavement laid hot paving tar will be poured into the joints of the curb till it rises and remains at the level of the pavement.

COAL-TAR DISTILLATE PAVEMENT.

Coal-tar distillate pavement will consist of a base and binder of 4½ inches in depth when compacted, and a wearing surface of 1½ inches in thickness when compacted.

The space over which the pavement is to be laid will be excavated to the depth of 6 inches below the top of the surface of the pavement when completed. Any objectionable or unsuitable material below the bed must be removed and the space filled with clean gravel or sand well rammed. The bed will then be trimmed so as to be exactly parallel to the surface of the new pavement when completed, and the entire road-bed will be thoroughly rolled with heavy steam roller.

Upon this foundation will be laid the base and binder 4½ inches in thickness, in the following manner:

Base.—The base will be composed of clean broken stone that will pass through a 3-inch ring, well rammed and rolled with a steam roller to a depth of 4 inches, and thoroughly coated with No. 4½ coal-tar paving cement, or its equivalent asphalt cement, as herein specified, in the proportion of about 1 gallon to the square yard of base.

Binder.—The second or binder course will be composed of clean broken stone, thoroughly screened, not exceeding 1½ inches in the largest dimension, and No. 4 coal-tar paving cement, or its equivalent asphalt cement. The stone will be heated to a temperature between 230° and 250° F. by passing through revolving heaters and thoroughly mixed by machinery, with the paving cement in about the proportion of 1 gallon of No. 4 tar to one cubic foot of stone. It will be hauled upon the work,

spread upon the base course at least 2 inches thick and immediately rammed and rolled with hand and steam rollers while in a hot plastic condition.

Wearing surface.—The wearing surface will be composed of the following materials, and in the following proportions:

	Per cent.
Clean sharp sand	63 to 58
Broken stone or rock dust	28 to 23
Paving cement	13 to 15
Hydraulic cement .....	.9
Slaked lime .....	.15
Flower of sulphur .....	.1

The sand shall be clean, sharp river sand, free from clay, and of such size that not more than 20 per cent. shall be retained upon a sieve of 20 meshes to the inch, and not more than 5 per cent. shall pass a sieve of 70 meshes to the inch, about 60 per cent. to be coarser than 40 meshes to the inch.

The broken stone or stone dust shall be the residue from the crushing of stone from the base and binder which passes a sieve of not more than 6 meshes to the inch.

The paving cement shall be composed of refined Trinidad asphalt, 25 to 30 parts; No. 4 coal-tar paving cement, 75 to 70 parts. The refined asphalt must be equal in all respects to that prescribed for standard asphalt pavement.

The No. 4 coal-tar paving cement must be free from excess of sooty matter, naphthalene and creosote oils, as determined by the inspector of asphalt cements, and have such consistency or penetration as the Engineer Commissioner may prescribe.

The hydraulic cement, lime, and sulphur must be of the best commercial quality.

The materials for the wearing surface will be heated to not over 260° Fahrenheit, the paving cement in kettles, the sand and stone dust in revolving heaters. To the latter the hydraulic cement, lime, and sulphur will be added cold in the sand box before going to the mixer.

They will be thoroughly mixed by approved machinery, and the mixture carried upon the work, where it will be spread upon the binder course 2 inches thick with hot iron rakes and other suitable appliances, and immediately compacted with hot tamping irons and hand and steam-rollers, while in a hot and plastic state. In spreading the material the joints are to be diagonal to the line of the street, or at right angles, as may be ordered. The surface will be finished with a dusting of dry hydraulic cement rolled in. In cool weather, or when ordered, the carts carrying the mixture are to be protected with canvas covers.

The pavement so constructed must be a solid mass six (6) inches thick, and must be thoroughly rolled and cross-rolled until it has become hard and solid. It must be equal in every respect to the best pavement of this class which has been heretofore laid.

The relative proportions of the component materials will be changed upon the order of the Engineer Commissioner, as occasion shall require.

All materials used, as well as the plant and methods of manufacture, will be subject to the inspection and approval of the Engineer Commissioner.

The degree of fineness, both of sand, stone dust, and powdered limestone, will be determined by testing with screens, as follows: The powdered carbonate of lime will be of such degree of fineness that 16 per cent. of weight shall be an impalpable powder of limestone, and the whole of it shall pass a No. 26 screen. The sand will be of such size that no more than 50 per cent. of it will pass a No. 50 screen. The broken stone or stone dust shall be the residue from the crushing of stone from the base and binder which passes a sieve of not more than 6 meshes to the inch.

Gutters, wherever directed, will be granite block or brick of such width as may be directed, laid upon a hydraulic base of not less than 4 inches in thickness, in accordance to specifications for granite block pavement or brick gutters.

COMBINATION ASPHALT PAVEMENT ON BITUMINOUS BASE.

Combination asphalt pavement on bituminous base will consist of a base 4 inches, a binder of 1½ inches, and a wearing surface of 1½ inches in thickness, when compacted.

The space over which the pavement is to be laid will be excavated to the depth of 7 inches below the top of the surface of the pavement when completed. Any objectionable or unsuitable material below the bed must be removed and the space filled with clean gravel or sand well rammed. The bed will then be trimmed so as to be exactly parallel to the surface of the new pavement when completed, and the entire road bed will be thoroughly rolled with a heavy steam roller weighing not less than 5 tons.

Upon this foundation will be laid the base and binder, 5½ inches in thickness, in the following manner:

Base.—The base will be composed of clean broken stone that will pass through a

3-inch ring, well rammed and rolled with a steam roller weighing not less than 5 tons, to a depth of 4 inches. The rolling will be continued until the stone ceases to creep before the roller, and until it is evident the final compression has been reached. It will then be thoroughly coated with No. 4 coal-tar paving cement or its equivalent, asphalt cement, in the proportion of about one gallon to the square yard of base.

Binder.—The second or binder course will be composed of clean broken stone, thoroughly screened, not exceeding 1 inch in the largest dimension, and No. 4 coal-tar paving cement or its equivalent, asphalt cement. The stone will be heated to a temperature between 230° and 250° Fahrenheit by passing through revolving heaters and thoroughly mixed by machinery with the paving cement in about the proportion of 1 gallon of the latter to 1 cubic foot of stone. It will be hauled upon the work, spread upon the base course to such thickness that when compacted it will be 1½ inches thick, and immediately rammed and rolled with hand and steam rollers while in a hot, plastic condition.

Wearing Surface.—The wearing surface will be 1½ inches thick when compacted, and will conform in all other respects to the wearing surfaces as prescribed for the standard asphalt pavement, as described in these specifications.

The pavement so constructed must be a solid mass, 7 inches thick, and must be thoroughly rolled and crossed rolled until it has become hard and solid. It must be equal in every respect to the best pavement of this class which has been heretofore laid.

Gutters, wherever directed, will be granite block or brick of such width as may be directed, laid upon a hydraulic base of not less than 4 inches in thickness, in accordance to specifications for granite block pavement and for brick gutters herein.

COMBINATION ASPHALT PAVEMENT ON HYDRAULIC BASE.

The combination asphalt pavement on hydraulic base will be 9 inches in thickness, consisting of a base composed of 6 inches of hydraulic concrete and 2 inches of binder, 1½ inches when compacted, and a wearing surface of standard asphalt 2½ inches in thickness, or 1½ inches when compacted.

The space over which the pavement is to be laid will be excavated to the depth of 9 inches below the top surface of the pavement when completed. Any objectionable or unsuitable matter below the bed will be removed, and the space filled with clean gravel or sand well rammed. The bed will then be trimmed so as to be parallel to the surface of the pavement when completed, and the entire road-bed will be thoroughly rolled with a heavy steam roller.

Upon the bed thus prepared the pavement will be laid as follows:

Hydraulic base.—This will be laid 6 inches in thickness, conforming in all other respects to the hydraulic base prescribed for the standard asphalt pavement as described in these specifications.

Binder course.—This binder course will conform in all respects to the binder course prescribed for the combination asphalt pavement on bituminous base, as described in these specifications, and will be 1½ inches in thickness when compacted.

Wearing surface.—The wearing surface will be 1½ inches thick when compacted, and will conform in all other respects to the wearing surfaces as prescribed for the standard asphalt pavement, as described in these specifications.

NEW COMBINATION ASPHALT PAVEMENT ON BITUMINOUS BASE.

The new combination asphalt pavement on bituminous base will be 6 inches in thickness, consisting of a base of broken stone 4 inches thick, laid in coal-tar paving cement, a binder course 2 inches thick, 1½ inches thick when compacted, the base and binder to be 4½ inches thick when compacted, and a wearing surface of standard asphalt 1½ inches thick when compacted.

The space over which the pavement is to be laid will be excavated to the depth of 7 inches below the top surface of the pavement when completed. Any objectionable or unsuitable matter below the bed will be removed and the space filled with clean gravel or sand well rammed. The bed will then be trimmed so as to be parallel to the surface of the pavement when completed, and the entire road bed will be thoroughly rolled with a heavy steam roller.

Upon the bed thus prepared the pavement will be laid as follows:

Bituminous base.—This course will be laid 4 inches in thickness, conforming in all respects to the base course prescribed for the coal-tar pavement as described in these specifications.

Binder course.—This binder course will conform in all respects to the binder course prescribed for the coal-tar pavement as described in these specifications, and will be 1½ inches in thickness when compacted.

Wearing surface.—The wearing surface will be 1½ inches thick when compacted, and will conform in all other respects to the wearing surfaces as prescribed for the standard asphalt pavement as described in these specifications.

LAYING GRANITE BLOCKS ADJACENT TO RAILWAY TRACKS.

When the pavement is laid adjacent to the tracks of a street railroad, one row of selected granite paving blocks will be laid next to the track, alternating as headers and stretchers toothing into the pavement. The blocks will be furnished by the District at the property yards or District reservations, and must be hauled to the street at the contractors' expense.

The foundation will extend to the depth of the bottom of the cross ties, and will be similar in all respects to the foundation of the carriageway pavement, except as to the thickness of base. If the foundation consists of bituminous concrete, the blocks will be laid directly upon and imbedded in the binder while it is still in a hot and plastic condition. If the foundation consists of hydraulic cement concrete, the base will be covered with a layer of fine sharp sand, washed and dried, 2 inches in thickness, and the blocks will be laid directly upon and imbedded in this sand, with close joints. The top of the blocks will be even with the surface of the tread of the rail, which shall conform with the grade of the street. The blocks will be laid before the wearing surface is laid upon the carriageway, and carefully rammed to a firm bed. Care will be taken to fit them well up against the stringers of the railroad. The space back of the blocks will be filled to the surface of the base for the carriageway pavement with the same material that is used for said base well rammed.

Immediately after the wearing surface shall have been laid, clean, fine, hot gravel not larger than three-fourths of an inch in any dimensions, will be poured into the joints of the blocks until they become nearly filled. There will then be poured into the joints, at a temperature of 300° Fahrenheit, paving cement made of No. 6 coal-tar distillate, until the joints are completely filled flush with the surface of the pavement. Additional fine, hot gravel will then be poured along the joints, and will be consolidated by tapping with a light rammer. If found necessary, additional paving cement will be poured between the blocks until the joints are thoroughly filled.

In measuring it is work for pavement, when standard-sized granite blocks are used the area included between the outer edge of the rail and a line parallel to and 6 inches from rail will be taken as the area of granite-block pavement laid. Bids will be based on this rule. When so ordered, the block pavement will be extended to cover the entire area included between the rail and a line parallel to and 2 feet distant from said rail.

ASPHALT BLOCK PAVEMENT.

The size of the blocks will be 4 by 5 by 12 inches, and a variation of one-fourth of an inch from these dimensions will be sufficient grounds for rejecting any block. The blocks will be composed of paving cement 8 to 12, crushed limestone 92 to 88.

The paving cement shall be of a quality in character equivalent to that prescribed for standard asphalt pavements. The petroleum must be freed from all impurities and brought to a specific gravity of from 18° to 22° Beaume, and a fire test of 250° Fahrenheit. The right is reserved to inspect the manufacture of the blocks and the preparation of the cement at any time.

All bids must be accompanied by a specimen block of the size and quality described in these specifications, labeled with the name of the bidder and the locality of the factory; bids not accompanied by specimen blocks will not be accepted. The blocks will be tested by such method as the Engineer Commissioner may prescribe, and all blocks furnished will be subject to test and approval.

The space over which the pavement is to be laid will be excavated to the depth of 12 inches below the top line of the proposed pavement, when fully rammed. Any objectionable or unsuitable material below the bed will be removed, and the space filled with clean gravel or sand. Care must be taken in excavating to preserve the proper crown. All holes and inequalities will be filled with sand or gravel, such filling to be thoroughly compacted by rolling or ramming.

Upon this foundation, as above, is to be laid a bed of fine bank gravel, to be screened from all pebbles measuring more than 1½ inches in their largest dimensions, 5 inches thick when compacted by rolling and ramming. Upon this will be laid a bed of fine, sharp sand, washed and dried, 2 inches in thickness, to serve as a bed for the blocks, which will be laid directly upon and imbedded in it with close joints. Special care will be observed to make the surface of this bed of sand exactly parallel to the surface of the pavement when complete. The blocks must be laid by the pavers standing or kneeling upon the blocks already laid, and not upon the bed of sand.

The blocks are to be laid diagonally with the line of the street or at right angles, and with such crown as the Engineer Commissioner may direct; each course to be of blocks of an uniform width and depth, and so laid that all longitudinal joints shall be broken by a lap of at least 4 inches. Each course of blocks will be driven against the course preceding it by a heavy maul in order to make the lateral joints as tight

as possible, and the longitudinal joints will be closed by pressing each course in the direction of its length by a lever. When thus laid the blocks will be immediately covered with clean, fine sand, entirely free from any loam or earthy matter, perfectly dry, and screened through a sieve or screen having not less than 20 meshes to the inch. The blocks will then be carefully rammed by placing a plank over several courses and ramming the plank with a heavy rammer. The ramming will be continued until the blocks reach a firm, unyielding bed and present a uniform surface, with proper grade and crown. Any lack of uniformity in the surface must be corrected by taking up and relaying the blocks. When the ramming is complete a sufficient amount of fine, dry sand, as above described, will be spread over the surface, and swept or raked into the joints.

SPECIFICATIONS FOR LAYING GRANITE BLOCK PAVEMENT.

The granite block pavement will be laid on a foundation of gravel and sand, with filling of hot paving cement. The granite blocks will be furnished by the District at the property yards, or at streets or reservations where they may be stored. The space over which the pavement is to be laid will be excavated to the depth of 12½ inches below the surface of the proposed pavement when completed. Any objectionable or unsuitable material below the bed will be removed and the space filled with clean gravel or sand. Care must be taken in excavating to preserve the proper crown. All holes and inequalities to be filled with sand or gravel, and such filling to be thoroughly compacted by rolling or ramming.

Upon this foundation is to be laid a bed of fine bank gravel, 4 inches in depth, when compressed, screened from all pebbles measuring more than 1½ inches in their largest dimensions, and thoroughly rammed. Upon this will be laid a bed of fine, sharp sand washed and dried, 3 inches in thickness, to serve as a bed for the blocks, which will be laid directly upon and imbedded in it, with close joints. The stone blocks are to be laid at right angles with the line of the street; each course to be of blocks of a uniform width and depth, and so laid that all longitudinal joints shall be broken by a lap of at least 2 inches. When thus laid, the blocks will be immediately covered with clean, fine, hot, dry gravel, in proper quantities, raked until all the joints become filled therewith, and the blocks will then be carefully rammed to a firm, unyielding bed, with uniform surface and with proper grade. There will then be poured into the joints, at a temperature of 300° Fahrenheit, paving cement of proper consistency, to be obtained by the direct distillation of coal tar. The cement required is that ordinarily numbered six at the manufactory. It will be poured into the joints of the pavement until the sand beneath and the gravel between the blocks will absorb no more and the joints are filled flush with the upper surface of the pavement. Dry, hot gravel not larger than three-fourths of an inch in any dimension will then be poured along the joints, and will be consolidated by tapping with a light rammer. Any wastage of paving cement by pouring over the surface of the pavement instead of between the blocks must be covered with a sufficient quantity of fine, dry gravel to absorb it.

SPECIAL PAVEMENTS.

Bidders are at liberty to submit for consideration proposals and specifications for any special or patented pavement which may be deemed suitable for roadways, furnishing in each case all necessary particulars and accurate statements of components and method of manufacture.

MACADAM PAVEMENT.

Macadam pavements will be 12½ inches thick when fully compressed, and will be laid in three courses, the two lower courses each being 6 inches thick when compressed, and the top course one-half inch.

The space over which the pavement is to be laid will be excavated to the depth of 12½ inches below the top line of the proposed new pavement when fully compressed. Should there be any spongy material or vegetable matter in the bed thus prepared, all such material will be removed and the space filled with clean gravel or sand. Care must be taken in excavating to preserve the proper crown parallel to the surface of the street when completed; all holes and inequalities to be filled to a proper level with sand or gravel only, such filling to be well and faithfully compacted by rolling or ramming, and the entire roadbed will be thoroughly compacted by rolling and ramming so as to present a smooth and regular surface.

On this bed the metal for the first course will be spread in a uniform layer of such thickness as to give a depth of 6 inches when thoroughly compacted. This layer will

When to be compacted by rolling, and ramming in such places as the roller can not reach; the roller will either be a steam roller or horse roller, its weight being not less than 3,000 pounds, and its width such that the weight per inch of run will not be less than 125 pounds. The District will furnish, if desired, a suitable roller weighing about 10,500 pounds, made of iron with grooves, and requiring five or six horses for its proper use, according to grade. The rolling will be continued until the stone ceases to sink under the roller or to creep in front of it; the amount of rolling will not be less than ten hours to each 1,000 yards of surface.

The second course of metal will be spread on the first course in a uniform layer of the same depth as before, and after being thoroughly wet, either by hose or a sprinkling cart, will be rolled and rammed in precisely the same manner and to the same extent as the first course.

The size of metal in the first and second courses will be such that it will pass through a ring $2\frac{1}{2}$ inches in diameter; i. e., the largest dimensions of any stone must not exceed $2\frac{1}{2}$ inches. Any stone larger than this will be absolutely rejected, and must be either removed from the street or rebroken to proper size by the contractor. The material for the top course will be fine gravel, varying in size from one-eighth to three-fourths of an inch in their largest dimensions, or it may be composed of the finer particles of stone obtained by screening the stone for the lower courses. These particles of stone will be of the same size as the gravel above mentioned. If so ordered by the Engineer Commissioner, the material for the top course may have mixed with it such a proportion of loam or binding material as he may direct. All gravel for the top course larger than that specified shall be removed from the material before it is hauled to the street. Stone dust will not be used for a top course.

The material for the top course will be spread upon the second course in a uniform layer 1 inch in thickness, and after being thoroughly wet by means of a hose or sprinkling cart, will be rolled and rammed in the same manner and to the same extent as the first and second courses.

The stone for the first and second courses must be of hard and compact texture and uniform grain. Blue rock (gneiss), trap, granite, flint (quartz), and the harder varieties of limestone will be accepted. Bidders will submit with their bids samples of the stone which they propose to furnish, and all stone which does not equal the sample in quality and size will be rejected. The stone must have on all sides a rough surface, obtained by fracture. Water-worn pebbles and broken cobblestones will not be accepted. The stone preferred is the harder variety of compact gneiss found on certain portions of Rock Creek, Piny Branch, Broad Branch, and other streams north of the boundary. Disintegrated and weather-worn stones from the surface of the quarry will not be accepted.

SPECIAL SPECIFICATIONS FOR STREETS PAVED WITH COBBLE AND RUBBLE STONE.

These streets are now paved with cobble and rubble, and the new pavement will be laid upon this old pavement as a base. The street will be carefully gone over and all loose earth and other material of like nature removed. Stones which project too much will be rammed down, and where holes exist they will be repaired in a manner to make the base solid and firm. The gutter flags will be removed and sufficient earth excavated to permit of the emplacement of the regular bituminous base, as prescribed for asphalt pavements on bituminous base. This bituminous base will then be put in.

The whole area between the curbs will then be covered with a coat of binder (as prescribed for asphalt pavement on bituminous base), which will be carefully rammed into all interstices, and will be of such thickness that it will, when thoroughly compacted, be at least one-half inch above the most projecting stones. This will be thoroughly and carefully rolled to a smooth and even surface.

Upon this will be laid a wearing surface coat of asphalt composition conforming in all respects to that prescribed for the wearing surface coat of the asphalt pavements on bituminous base.

The price named for the pavement will include everything done on the street, except work in connection with setting or resetting curb and laying sidewalks.

SPECIFICATIONS FOR RESURFACING CONCRETE PAVEMENTS.

The work to be done under this contract includes the resurfacing of all concrete pavements where necessary during the period for which the contract shall be made. The concrete pavements are of two general classes, viz: those composed of an asphalt cement on a base of hydraulic-cement concrete, known as standard asphalt pavement, and those composed of coal-tar paving cement on a bituminous binder and base of broken stone, known as coal-tar, coal-tar distillate or vulcanite pavements.

The pavements are to be resurfaced with such materials as may be directed. The total amount of work is approximately as follows for the year 1891-92:

Base of broken stones.....	cubic yards..	100
Bituminous binder.....	do.....	200
Base of hydraulic-cement concrete.....	do.....	50
Coal-tar surface.....	square yards..	25,000
Asphalt surface.....	do.....	25,000
Laying granite-block pavement.....	do.....	500

Streets and avenues to be resurfaced will be designated by the Engineer Commissioner, and the work will be done at such times as may be ordered.

STANDARD ASPHALT CONCRETE PAVEMENT.

For the resurfacing of these pavements the following specifications will be followed. The base (when required) will be laid as follows:

One measure of cement and two of clean, sharp, washed sand, free from clay, will be thoroughly mixed dry, and made into a mortar with the least possible amount of water; broken stone or hard brick of acceptable dimensions and character, thoroughly cleaned from dust and dirt, drenched with water, but containing no loose water in the heap, will then be incorporated immediately with the mortar in such quantities as will give a surplus of mortar when rammed. This proportion, when ascertained, will be regulated by measure. Each batch of concrete will be thoroughly mixed, the mixing being continued on the board until each piece of stone or brick is completely coated with mortar; it will then be spread and at once thoroughly compacted by ramming until free mortar appears upon the surface. The whole operation of mixing and laying each batch will be performed as expeditiously as possible, with the use of a sufficient number of skilled men. No gravel will be used in the concrete, but only angular fragments of stone or brick, having rough faces obtained by fracture, and measuring not more than $1\frac{1}{2}$ inches in their largest dimensions. The upper surface of the base will be made parallel with the crown of the pavement to be laid, and will be suitably protected from the action of the sun and wind until set.

The cement used will conform to the District specifications for cement, and will be subject in all respects to the approval of the Engineer Commissioner.

The wearing surface will be composed of (1) Refined Trinidad or other acceptable asphalt; (2) heavy petroleum residuum oil; (3) fine sand, containing not more than 5 per centum of loam or clay; (4) fine stone dust; (5) fine powder of carbonate of lime.

The asphalt must be refined, and as far as possible freed from foreign organic and animal matter and volatile oil, and should contain at least 60 per cent. of bituminous matters soluble in bisulphide of carbon. The residuum oil must be free from coke and other impurities, of a specific gravity of from 18° to 22° Baumé, and withstand a fire test of 250° Fahrenheit. The refined asphalt and residuum oil will be mixed in the following proportions by weight:

	Parts.
Asphalt.....	100
Petroleum.....	from 16 to 22

The proportion of mixture for other asphalts will be determined by their chemical composition.

The asphaltic cement, made in the manner above described, will be mixed with other materials in the following proportions by weight, viz:

Asphaltic cement.....	from 13 to 16
Sand.....	from 63 to 58
Stone dust.....	from 28 to 23
Pulverized carbonate of lime.....	from 3 to 5

The proportion of materials used will depend upon their character and the traffic on the street, and will be determined by the Engineer Commissioner. If the proportions of the mixture are varied in any manner from those specified, the mixture will be condemned. Its use will not be permitted, and, if already placed on the street, it will be removed and replaced by proper material at the expense of the contractor.

The mixture of sand, stone dust, and the asphaltic cement will be heated separately to about 300° Fahrenheit. The pulverized carbonate of lime, while cold, will be mixed with the hot sand in the required proportions, and then mixed with the asphaltic cement at the required temperature and in the proper proportion in a suitable apparatus, so as to effect a thoroughly homogeneous mixture.

The pavement mixture prepared in a manner thus indicated will be laid on the foundation in two coats. The first coat, called cushion coat, will contain from 2 to 4 per cent. more asphaltic cement than given above; it will be laid to such depth as will give a thickness of half an inch after being consolidated by a roller. The second

coat, called surface coat, prepared as above specified, will be laid on the cushion coat; it will be brought to the ground in carts at a temperature of not less than 250° Fahrenheit, and if the temperature of the air is less than 50°, the contractor must provide canvas covers for use in transit. It will then be carefully spread, by means of hot iron rakes, in such manner as to give uniform and regular grade, and to such depth that, after having received its ultimate compression of two-fifths, it will have a net thickness of 2 inches. This depth will be constantly tested by means of gauges furnished by the Engineer Commissioner. The surface will then be compressed by hand rollers, after which a small amount of hydraulic cement will be swept over it, and it will then be thoroughly compressed by a steam roller weighing not less than 250 pounds to the inch run, the rolling being continued for not less than five hours for every 1,000 yards of surface.

All materials used, as well as the plant and methods of manufacture, will be subject to the inspection and approval of the Engineer Commissioner.

The degree of fineness both of sand and powdered limestone will be determined by testing with screens, as follows: The powdered carbonate of lime will be of such degree of fineness that 16 per cent. by weight shall be an impalpable powder of limestone, and the whole of it shall pass a No. 26 screen. The sand will be of such size that not more than 50 per cent. of it will pass a No. 80 screen, and the whole of it shall pass a No. 20 screen.

The broken stone or stone dust shall be the residue from the crushing of stone from the base and binder which passes a sieve of not more than 6 meshes to the inch.

Gutters, wherever directed, will be granite block of such width as may be directed, laid upon a hydraulic base of not less than 4 inches in thickness, in accordance to specifications for granite-block pavement.

The law requires that the pavement to be laid shall be in no respect inferior to the best of those now in service.

After being laid the pavement shall be protected against travel for at least twenty-four hours, and as much longer as may be ordered by the authorized representative of the District, by strong barricades, said barricades to be subject to approval by the Engineer Commissioner.

COAL-TAR PAVEMENTS.

For the resurfacing of these pavements, the following specifications will be followed:

Base.—The "base," when required, will be composed of clean broken stone that will pass through a 3-inch ring, well rammed and rolled with a steam roller to a depth of 4 inches, and thoroughly coated with No. 4½ coal-tar paving cement in the proportion of about 1 gallon to the square yard of base.

Binder.—The second or binder course will be composed of clean broken stone, thoroughly screened, not exceeding 1½ inches in the largest dimension, and No. 4 coal-tar paving cement. The stone will be heated to a temperature between 230° and 250° F. by passing through revolving heaters and thoroughly mixed by machinery with the paving cement in the proportion of about 1 gallon of No. 4 tar to 1 cubic foot of stone. It will be hauled upon the work, spread upon the base course at least 2 inches thick, and immediately rammed and rolled with hand and steam rollers while in a hot and plastic condition.

Wearing surface.—The wearing surface will be composed of the following materials and in the following proportions:

	Per cent.
Clean sharp sand	63 to 58.0
Broken stone or rockdust	28 to 23.0
Paving cement	13 to 15.0
Hydraulic cement .....	.9
Slacked lime .....	.15
Flower of sulphur .....	.1

The sand shall be clean, sharp river sand, free from clay, and of such size that not more than 20 per cent. shall be retained upon a sieve of 20 meshes to the inch, and not more than 5 per cent. shall pass a sieve of 70 meshes to the inch, about 60 per cent. to be coarser than 40 meshes to the inch.

The broken stone or stonedust shall be the residue from the crushing of stone from the base and binder which passes a sieve of not more than 6 meshes to the inch.

The paving cement shall be composed of refined Trinidad asphalt, 25 to 30 parts, No. 4 coal-tar paving cement, 75 to 70 parts. The refined asphalt must contain at least 60 per cent. of pure bituminous matter soluble in carbon bisulphide.

The No. 4 coal-tar paving cement must correspond to a standard to be furnished by the Engineer Commissioner, and be free from excess of sooty matter, naphthalene, and creosote oils as determined by the inspector of asphalt and cements. The hydraulic cement, lime, and sulphur must be of the best commercial quality.

The materials for the wearing surface will be heated to not over 250° F., the paving cement in kettles, the sand and stonedust in revolving heaters. To the latter the hydraulic cement, lime, and sulphur will be added cold in the sand box before going to the mixer.

They will be thoroughly mixed by approved machinery, and the mixture carried upon the work, where it will be spread upon the binder course, 2 inches thick, with hot iron rakes and other suitable appliances, and immediately compacted with hot tamping irons and hand and steam rollers, while in a hot and plastic state. In spreading the material, the joints are to be diagonal to the line of the street. The surface will be finished with a dusting of dry hydraulic cement rolled in. In cool weather, or when ordered, the carts carrying the mixture are to be protected with canvas covers.

The pavement so constructed must be a solid mass 6 inches thick, and must be thoroughly rolled and cross rolled until it has become hard and solid. It must be equal in every respect to the best pavement of this class which has been heretofore laid. The relative proportions of the component materials will be changed upon the order of the Engineer Commissioner, as occasion shall require. After being laid, the pavement shall be protected by strong barricades for at least twenty-four hours, or longer if deemed necessary by the Engineer Commissioner. Barricades shall be subject to approval by the Engineer Commissioner.

LAYING GRANITE BLOCKS ADJACENT TO RAILWAY TRACKS.

When the pavement is laid adjacent to the tracks of a street railroad, one row of selected granite paving blocks will be laid next to the track, alternating as headers and stretchers toothing into the pavement. The blocks will be furnished by the District at the property yard or District reservations, and must be hauled to the street at the contractor's expense. The foundation will extend to the depth of the bottom of the cross-ties, and will be similar in all respects to the foundation of the adjacent carriage-way pavement, except as to thickness of base. If the foundation consists of bituminous concrete, the blocks will be laid directly upon and imbedded in the binder while it is still in a hot and plastic condition. If the foundation consists of hydraulic cement concrete, the base will be covered with a layer of fine sharp sand, washed and dried, 2 inches in thickness, and the blocks will be laid directly upon and imbedded in this sand, with close joints. The top of the blocks will be even with the surface of the tread of the rail, which shall conform with the grade of the street. The blocks will be laid before the wearing surface is laid upon the carriage-way, and carefully rammed to a firm bed. Care will be taken to fit them well up against the stringers of the railroad.

The space back of the blocks will be filled to the surface of the base for the carriage-way pavement with the same material as is used for said base, well rammed. Immediately after the wearing surface shall have been laid, clean, fine, hot gravel, not larger than three-fourths of an inch in any dimensions, will be poured into the joints of the blocks until they become nearly filled.

CUTTING OUT AND REMOVING OLD CONCRETE PAVEMENTS.

Ordinarily in all work of repairs to bad places in the pavements no allowance will be made for cutting out and removing the old concrete pavements. The price designated in any contract which may be made under these specifications for cutting out and removing old concrete pavements will only be allowed in those cases where it is necessary to remove ridges or depressions where the material of the wearing coat is sound but of uneven surface, and also where the cutting is rendered necessary to make proper connection with an old pavement.

The Engineer Commissioner shall in all cases decide whether the cutting out shall be paid for or not; and his decision shall be final.

GUARANTY.

All work of resurfacing will be guarantied and kept in repair by the contractor for a period of five years from date of its completion. Ten per centum of the cost of this work will be retained and disposed of as otherwise provided for herein.

It is hereby expressly understood and agreed that the retain fund shall be subject to the control of the Commissioners of the District of Columbia for the purpose of maintaining the work in repair for the period specified, and the commissioners, at their discretion, may require of the contractor and his sureties that any portion of said retain fund which may have been expended for the maintenance of the work shall be made good by further deposit.

SPECIFICATIONS FOR REPAIRS TO CONCRETE PAVEMENTS.

The work to be done under this contract includes the repairing of all concrete pavements where necessary, the repairs of cuts made for tapping sewers and pipes, or for other purposes, and generally all patching and miscellaneous work necessary to keep the concrete pavements in good condition for travel during the contract period. The pavements are to be repaired with such material as may be directed. The total amount of work is approximately as follows:

Base of broken stones.....	cubic yards..	50
Bituminous binder.....	do.....	100
Base of hydraulic cement concrete.....	do.....	25
Coal-tar surface.....	do.....	15,000
Asphalt surface.....	do.....	15,000
French mastic surface.....	square yards..	500
Laying granite-block pavement.....	do.....	100

The repairs will be made at such times and places and in such manner as may be directed, and when deemed necessary on certain streets, between the hours of 8 p. m. and 8 a. m. All old material will be cut out and removed at the contractor's expense and in case of undercuts the overhanging portion will be removed.

In the case of plumber cuts the earth will be excavated to the depth of the base of the pavement, and replaced with broken stone or old concrete laid in two layers, and when in the opinion of the inspector of minor repairs the cut has not been originally properly compacted by ramming, the earth filling will be removed by the contractor to such depth as may be ordered, and properly replaced with thorough ramming. The expenses of this replacement will be separately recorded for each cut, so that they may be charged to the accounts of the several parties who have made the cuts.

Each layer of filling of gravel or old concrete shall be thoroughly rammed to afford a firm foundation for the surface of the pavement, and in case the foundation should settle so as to cause a depression in the pavement at any time within the period of this contract, the contractor will be required to take up the payment and relay it properly at his own expense.

The holes cut out will be cleaned and painted with hot paving cement, composed as follows: For asphalt pavements, pure asphalt, 10 parts; heavy petroleum, 1 part. For coal-tar pavements, pure asphalt, 1 part; coal tar No. 4, 4 parts.

Barricades of a suitable form to prevent traffic over recently laid work shall be provided and kept in place until the surface has hardened sufficiently to withstand pressure. These barricades and their use must be subject to the approval of the Engineer Commissioner. Work in repairing over plumber, electric-light and similar cuts will be done immediately on receipt of written order from the Engineer Commissioner under penalties prescribed in the general stipulations.

CUTTING OUT AND REMOVING OLD CONCRETE PAVEMENTS.

Ordinarily in all work of repairs to bad places in the pavements no allowance will be made for cutting out and removing the old concrete pavements. The price designated in any contract which may be made under these specifications for cutting out and removing old concrete pavements will only be allowed in those cases where it is necessary to remove ridges or depressions where the material of the wearing coat is sound but of uneven surface, and also where the cutting is rendered necessary to make proper connection with an old pavement. The Engineer Commissioner shall in all cases decide whether the cutting out shall be paid for or not; and his decision shall be final. Repairs to the standard asphalt-concrete pavements and to the coal-tar pavements will be governed by the foregoing specifications for resurfacing such pavements.

FRENCH MASTIC PAVEMENTS.

For the repairs of sidewalks laid with French mastic, the holes will be cleaned out and the edges cut square. The base will be filled, if necessary, to within five-eighths of an inch of the surface with a concrete of hydraulic cement and small pebbles mixed in the standard proportions. When the base has set the edges of the surface will be thoroughly heated with hot mastic; this mastic will then be removed and fresh hot mastic will be laid over the place to be repaired and thoroughly ironed with smoothing irons. This wearing surface will be five-eighths of an inch in thickness and composed of the following parts by weight, viz:

Seysell, or Nenchatel mastic.....	10
Asphaltic cement.....	4
Grit.....	36

These proportions may be slightly varied if deemed advisable to improve the quality of the wearing surface. The pavement must be equal in every respect to that laid on the north side of Pennsylvania avenue, between Twelfth and Thirteenth streets, northwest.

GUARANTY.

All work of minor repairs will be guarantied and kept in repair for one year.

PAYMENTS.

Payments will be made monthly for all work certified as completed in accordance with these specifications. Bidders will note the fact that material for repairs to asphalt and coal-tar distillate surfaces will be paid for by the cubic yard instead of by the square yard, as has heretofore been the rule. The material will be measured in the cart when brought upon the line of the work.

SPECIFICATIONS FOR STANDARD SEWERS AND SEWER CONSTRUCTION MATERIAL.

GENERAL SPECIFICATIONS FOR THE CONSTRUCTION OF SEWERS.

[The contractor will be held responsible for maintenance for a period of five years after completion of the work.]

TRENCHES.

The ground will be excavated in open trenches to the necessary width and depth. The horizontal diameter of the sewer at the springing line, including the walls thereof, shall be considered the necessary width for the sewer trench. That portion formed for the invert of the sewer will be excavated to conform to the external form and dimensions of the same, should the nature of the ground so allow. If the character of the ground met with in the excavation is such that the external form of the sewer can not be preserved, the excavation will be made as near as possible to the external form of the sewer, and the space between the external sewer lines and the bottom lines of the excavation as made, for a width equal to the outside horizontal diameter of the sewer at the springing line, will be filled with hydraulic cement concrete at the expense of the contractor, the cost of which shall be considered as an incident to the construction of the sewer. If the material found in the bottom of the sewer trench contains substances decaying or liable to decay, or if, for any other reason, it is, in the opinion of the Engineer Commissioner, unsuitable for a foundation, upon receipt of a written order it will be removed to such depth and width as shall be therein directed, and suitable material will be deposited in its place, which will be paid for as extra work.

All irregularities in the bottom or sides of the trench below the center of the sewer will be filled to the required form with hydraulic cement concrete, made as herein specified, at the expense of the contractor. Bracing and shoring will be used when necessary. The filling of the trench and removal of timber will be done in such manner as to prevent the slipping or caving of the sides as the work progresses. If ordered to be left in the trench, the bracing and shoring so left will be measured and paid for at a price to be determined by the Engineer Commissioner. Should the exigencies of the work so require, it will be carried on without intermission upon the order of the Engineer Commissioner. The excavations will be kept free from water during the construction of the work; no concrete or other work will be laid in water, and no allowance made for pumping or otherwise removing the water. All slides or caving of the sides of the trenches or cuts will be taken out and back-filled and no additional price shall be paid therefor.

The back-filling must be brought up evenly to the top of the trench, in layers not exceeding 6 inches in depth, and thoroughly rammed; it being required that not less than double the labor expended in replacing the back-filling shall be expended in compacting the same with iron-shod rammers, weighing not less than twelve pounds each.

The contractor will replace all pavements disturbed in strict conformity with the District of Columbia specifications for that class of pavement; any deficiency in materials of the pavement when disturbed, either in quantity, quality, or both, to be supplied by and at the expense of the sewer contractor, excepting asphalt, concrete, and granite block pavements, which will be relaid by and at the expense of

the District. If, however, such pavements should be injured by the contractors outside the limits prescribed for the trenches, the cost of restoring such excess will be charged against the contractor and deducted from any amounts found due, and he will be required at his own expense to maintain the ground surface of the pavement over the line of trench with the best material available from the excavation until such time as the pavement is relaid. The cost of subsequent repairs of all pavements (whether relaid in the first instance by the District or by the contractor) or of any other work, made necessary within the period for which this work is guaranteed, by after settlement in the filling of the trenches, will be charged against the 10 per centum retained and invested, as provided in paragraph seven of the general stipulations hereto attached; and it is expressly agreed that this fund shall be subject to the control of the Commissioners of the District of Columbia for this purpose.

The material from the trenches and that used in the construction of the work will be so deposited as not to endanger the work or unnecessarily obstruct public travel, and so that free access may be had at all times to all fire-plugs and water-gates in the vicinity of the work. The surplus earth, as hereinafter indicated, will be the property of the contractor, and must be hauled away and disposed of by him. The cost of removing the surplus earth will be included in the price paid for the sewer.

A map and schedule is on file in the Engineer Department showing the location of the sewers included in the specifications, which can be seen by bidders. The right is reserved by the Commissioners of the District of Columbia to lay only such sewers shown on the map and schedule as may seem most necessary for the public benefit, or to add thereto an amount not exceeding 25 per cent.

The depth of excavation may be taken at 10 feet to the bottom of the pipe inside, for pipe sewers, and ten feet to the springing line of concrete sewers. These depths are subject to modification, depending on location and depths of existing sewers. Bidders are required to give a price for excavation and refilling, which price will be allowed in addition to the price bid for the sewer, in case of an increase, or deducted in case of a reduction, of the specified depths.

No payment will be made on account of rock excavation for which a special order shall not have been given prior to said excavation. All excavated material shall be considered as of ordinary character, except rock excavation removed by special order as above. Indurated gravel, disintegrated rock, and materials of like character, in the opinion of the Engineer Commissioner, will not be classed as rock excavation.

SEWER.

The sewers are to be constructed in strict conformity with the drawings furnished and the lines and levels given by the duly authorized assistant, and the directions given from time to time by the Engineer Commissioner or his agents. The work is subject to such modification as may be necessary during its progress, and in no case will any work in excess of the plans and specifications be paid for unless ordered in writing by the Engineer Commissioner. All railway tracks, water, sewer, and gas pipes, and other duly authorized structures will be properly supported and protected by the contractor during the construction of the work under or near them, so as not unnecessarily to interfere with their use. The connections with existing sewers and catch basins will be made according to plans and directions, and the cost of said connections will be included in the price per foot for new sewers. Whenever it is necessary to extend or relay any part of the house laterals, to insure a proper connection, they must be laid and thoroughly imbedded in concrete, particularly where said laterals cross the old sewers. The old sewer must be closed at each manhole and wherever a house lateral crosses it, with brick masonry or concrete; the manhole frames and covers removed and the manholes filled with earth, thoroughly rammed, to the surface of the street or sidewalk.

BRICK WORK.

The best quality of merchantable new bricks, burned hard and entirely through, free from injurious cracks, and with a crushing strength of not less than 5,000 pounds per square inch, will be used and must be thoroughly drenched immediately before laying. Every brick is required to be laid in full mortar joints. In no case is the joint to be made by working in mortar after the brick has been laid. Every second course will be laid with a line, and joints will not exceed three-eighths of an inch. The brick work of arches shall be properly bonded and keyed as directed. The vitrified fire-clay bricks to be used in inverts of main sewers will be of quality equal to sample vitrified bricks on file in the office of the superintendent of sewers and marked "sample vitrified fire-clay brick." One length of 6-inch terra cotta pipe will be built into the arch of the main sewers at the springing line, and Y branches laid in the pipe sewers at such places as are shown on the plan, or as may be ordered. These will be furnished

to the contractor at one of the property yards of the District free of cost, and are to be built into the sewers, and the ends projecting from the concrete foundation closed with brick and cement by the contractor.

MANHOLES.

Brick manholes will be constructed in the sewer at intervals of 150 to 200 feet. They are to be of form and dimensions shown on the drawings. Manholes are to be fitted with cast-iron frames and covers in dimensions, weight, and quality similar to those now used, and the drawings of which are on file in the office of the Engineer Commissioner. The iron is to be sound, free from imperfections, and thoroughly cleaned. Each manhole will be furnished with steps of wrought iron three-fourths inch in diameter, built into the brick work as shown on drawings, conveniently arranged for access to sewer. Lateral sewer and receiving basin connections will be built into the manholes whenever required.

RECEIVING BASINS.

Receiving basins will be built wherever shown on the plans, or ordered by the Engineer Commissioner. They will conform to the drawings, will be built with care, and will be made water-tight by plastering the interior with mortar composed of one part each of sand and Portland cement, the thickness of the coat of mortar being three-eighths of an inch. The tops of the basins will be covered with granite or bluestone heads set level with the sidewalk; the stones composing the tops will be rebated to receive a cast-iron cover similar to those now in use. Connections of basins with the sewers will be made with 12-inch pipes of terra cotta, laid in hydraulic cement concrete, as required for the sewer pipes.

MORTAR.

Mortar used in this work will be composed of cement and sand, in the proportion of one part of cement and two parts of loose sand by measure, *thoroughly mixed* dry, and a sufficient quantity of water afterwards added to form a rather stiff paste; it will be used within an hour after mixing, and not at all if once set. All cements used will be furnished by the District at the District cement house, and the cost of the same, at the cement contract rates, will be charged against the contractor. Sand used shall be clean, sharp, free from loam, vegetable matter, or other foreign substance. A platform shall be provided upon which the sand shall be placed when brought upon the line of the work. Water used shall be fresh and clean, free from earth, dirt, and sewage. Tight mortar boxes shall be provided by the contractor and no mortar shall be made upon the street otherwise than in such boxes. Upon asphalt pavements no mortar shall be made.

The thorough mixing and incorporation of all materials will be insisted upon, preferably by machine labor, but if done by hand labor the dry cement and sand will be turned over and mixed with shovels by skilled workmen not less than six times before the water is added. After adding the water the paste will be again turned over and mixed with shovels by skilled workmen not less than three times before it is used. The inner surface of the sewer from the invert fire-clay bricks or half pipe to the springing line shall be coated with mortar three-eighths of an inch in thickness, of Portland cement one part; sand, one and one-half parts. The surface upon which this mortar is applied shall be thoroughly wetted before the application of the coat of mortar, which must be well troweled.

CONCRETE.

Concrete will be composed of natural cement mortar proportioned and mixed as before described, to which will be added broken stone, so that the resultant mass shall contain for each part of cement two parts of sand and five parts of stone, all parts by measures. The broken stone will be thoroughly cleaned from all foreign substances, and will be screened whenever ordered. Sand, detritus, or any material other than hard angular fragments of stone, which will be retained upon a number 10 screen, will be considered a foreign substance. The stone will be broken to a size not greater than 2 inches in its greatest dimensions. A platform shall be provided upon which shall be delivered all broken stone brought upon the line of work.

The stone will be added immediately after mixing the mortar, being first drenched with water. The whole mass shall be thoroughly turned over and mixed until every piece of stone is enveloped with mortar, using only sufficient water to insure the proper incorporation of the ingredients. The contractors shall furnish the inspectors

with proper means and facilities for weighing the cement and for measuring the sand and stone. All work and material to be paid for will be measured and determined according to the specifications, and the plans and working lines which shall be given.

All material furnished and all work done not in accordance with these specifications shall be removed within twenty-four hours after written notice from the Engineer Commissioner, by and at the expense of the contractor, or, in case of his failure to do so, it will be removed and the cost charged to the contractor, and deducted from the amount due or which may become due him. Material to be furnished by the District (consisting of sewer pipe, branches, and cements) will be hauled from the place of storage to the work by the contractor. The contractor will be required to refill trenches, remove surplus material and supplies, and restore the streets to their original condition with promptness; also to maintain suitable bridges over trenches at street crossings in such manner as to accommodate travel on foot or by vehicle, as shall be directed. Lights necessary for properly lighting the trenches or other obstructions to travel must be maintained at the expense and risk of the contractor, who shall be liable to the District for all and every damage, public or private, that may occur in connection with his work. Lamps shall be kept burning at night at both ends of obstructions and at intervals of not more than 50 feet, and when a distance of 500 feet is obstructed the contractor shall employ a watchman to guard it.

GENERAL STIPULATIONS.

All loss or damage due to negligence or arising out of the nature of the work to be done, or from any unforeseen or unusual obstructions or difficulties which may be encountered in the prosecution of the same, or from the action of the elements, will be sustained by the contractors, who will be required, without cost to the District, to replace all pavements, etc., displaced or injured by them, and to remove from the street all surplus material, earth, rubbish, etc., immediately after completion of the work.

Failure to commence the work at the time specified, or to prosecute it thereafter in a satisfactory manner and at a rate of progress necessary, in the opinion of the District Commissioners, for its entire completion within the limits of time fixed by the contract, will be authority for the said Commissioners to suspend the contractors from the work and employ other parties to complete it, or to wholly annul said contract. All money due the contractors at the date of suspension will be applied to the conduct and maintenance of the work, and any excess of cost over and above the amount so retained will be charged against the contractor and sureties, who will each and severally be held liable therefor.

The contractor must be prepared to do any extra work that may be ordered, in writing, by the Engineer Commissioner, arising out of any modification in the plans or details that may appear necessary, and for this he will be paid at the contract rates for work of a similar character; or, if the extra work should be of a class for which no rate is fixed by the contract, the fair price to be paid will be determined by the Engineer Commissioner.

Inspectors will be appointed, whose duty it shall be to point out to the contractors any neglect or disregard of the specifications of contracts, but the right of final acceptance or condemnation of the work will not be waived at any time during its progress. Contractors will be held responsible for the faithful execution of their contracts; and upon all technical questions concerning the execution of the work in accordance with the specifications and measurements thereof the decision of the Engineer Commissioner of the District of Columbia shall be final. Ordinarily one inspector will be employed by the District for each section of work under contract; but if additional inspectors should be required they will be employed by the District, at the rate of \$4 per diem, in such numbers as in the opinion of the Engineer Commissioner may be necessary, and the cost of the same will be charged to the contractor.

Payments will be made monthly upon estimates approved by the Engineer Commissioner, less 10 per cent. of each estimate, to be withheld until the final payment, which will only be made upon the certificate of the said Commissioner that the work has been completed and properly executed to the satisfaction of a majority of the Board of Commissioners; but 10 per centum of the cost of all new work will be retained and invested as hereinafter provided.

All work must be commenced within — days and completed within — days after the date of the execution of the contract; if not so completed, the pay of all inspectors employed on the work after the time fixed for its completion will be charged against and deducted from any money that may be due or become due the contractor, as well as the sum of \$10 per diem for the same period, estimated as liquidated and fixed damages to the District arising from failure to complete the work at the time specified — time of completion of the contract being an essential element and consideration.

Good and sufficient bonds to the United States in a penal sum equal to the estimated amount of the contract, with sureties to be approved by the Commissioners of the

District of Columbia, will be required from all contractors, guaranteeing that their contract will be strictly and faithfully performed to the satisfaction of and acceptance by said Commissioners; and that the contractors will keep new work in repair for a term of five years from the date of the completion of their contracts, and 10 per centum of the cost of all new works will be retained as an additional security and a guaranty fund to keep the same in repair for said term, and the money so retained will be disposed of pursuant to the provisions of an act of Congress entitled "An act authorizing the Treasurer of the United States to credit the District of Columbia with certain moneys in lieu of investing the same in bonds," approved March 3, 1887. It is hereby expressly understood and agreed that the retain fund shall be subject to the control of the Commissioners of the District of Columbia for the purpose of maintaining the work in repair for the period specified, and the Commissioners, at their discretion, may require of the contractor and his sureties that any portion of said retain fund which may have been expended for the maintenance of the work shall be made good by further deposit.

Contractors will punctually pay the workmen who shall be employed by them upon the work under their contract, in cash current and not in what is denominated store pay or orders, and will from time to time, and as often as may be required by the Commissioners of the District of Columbia, furnish to said Commissioners satisfactory evidence that all persons who have done work or furnished materials have been paid as herein required; and if such evidence is not furnished, such sum or sums as may be necessary for such payment may, in the discretion of the said Commissioners, be retained until such claims are satisfied.

No contract or any interest therein shall be transferred by the parties to whom the award is made. It is a condition of all contracts that such transfers will be null and void, and will cause the contract to be annulled and the work to be given to other parties under the conditions mentioned in paragraph 2 of these general stipulations.

SPECIFICATIONS FOR TERRA COTTA MATERIAL.

QUALITY AND DESCRIPTION.

First. The pipe will be the best salt-glazed, ring pipe in 3-foot lengths, of good clay, thoroughly burned, perfectly cylindrical in form, and straight, not varying a quarter of an inch in diameter or line, the edges and surfaces true and free from defects. The branches will be in lengths of 2 feet, and in other respects similar to the common pipe. With each length of pipe and branches will be furnished one ring of the same material for covering the joint. With each branch pipe will be furnished a stopper, which will be a simple disk of vitrified clay three-fourths of an inch thick, to fit snugly within the bell end of the 6-inch outlet. All material furnished will be fully equal in quality to the sample submitted with the accepted proposal. The right is reserved to increase the estimated quantities by not exceeding 20 per cent.

QUANTITIES AND SIZES.

Second. The material will be of the following dimensions, viz:

		Feet.
Terra cotta pipe:		
6-inch	.....	1,000
8-inch	.....	1,000
12-inch	.....	40,000
15-inch	.....	8,000
18-inch	.....	3,500
21-inch	.....	2,000
24-inch	.....	3,000
Terra cotta Y branches:		
8x6-inch	.....	200
12x6-inch	.....	4,000
15x6-inch	.....	1,200
18x6-inch	.....	1,000
21x6-inch	.....	200
24x6-inch	.....	200

CONDITIONS OF DELIVERY.

Third. Material shipped by rail will be delivered at such points in the vicinity of the track as may be designated. In every case the cost of unloading and delivering the material ready for inspection will be paid by the contractor.

The material will be inspected upon delivery, and all which does not conform to the foregoing specifications in size, quality, or condition will be removed by the contractor. The contractor will also furnish such laborers as may be deemed necessary by the Engineer Commissioner to assist his agents in inspecting and culling the material. No approval by the inspector shall prevent rejections on account of any defects which may be discovered before the final payment.

Fourth. Bids will be received for the whole amount of material or for any part thereof but the successful bidder or bidders will be required to deliver not less than one-fourth of the amount awarded in his contract during each of the months of —, —, and —, —. In case these conditions are not complied with, the Commissioners may proceed on the dates above named to supply the deficiency by purchases in open market; and should the cost of these purchases exceed the contract price, the excess will be charged to the contractor, a sufficient balance being temporarily retained from the amounts due him in order to cover this contingency.

Fifth. Partial payments on and after —, —, subject to the above condition, will be made from time to time for an amount not less than one-fourth the award in each case, but 10 per cent. will be retained from each partial payment until 30 days after the delivery of the last lot.

GENERAL STIPULATIONS.

Failure to commence the delivery of material at the time specified, or to prosecute it thereafter in a satisfactory manner and at the rate of progress necessary, in the opinion of the District Commissioners, for its entire completion within the limits of time fixed by the contract, will be authority for the said Commissioners to suspend the contractors and employ other parties to complete it or to wholly annul said contract. All money due the contractors at the date of suspension will be retained until the delivery is completed, and be applied to the payment of any increased cost thereof, and any excess of cost over and above the amount so retained will be charged against the contractor and sureties, who will each and severally be held liable therefor.

Inspectors will be appointed whose duty it shall be to point out to the contractors any neglect or disregards of the specifications of contracts, but the right of final acceptance or condemnation of the material will not be waived at any time. Upon all technical questions and measurements the decision of the Engineer Commissioner of the District of Columbia shall be final. Ordinarily one inspector will be employed by the District for each consignment, but if on account of any apparent disregard of the specifications on the part of the contractor additional inspectors should be required, they will be employed by the District at the rate of \$4 per diem in such numbers as, in the opinion of the Engineer Commissioner, may be necessary, and the cost of the same will be charged to the contractor.

Good and sufficient bonds to the United States in a penal sum equal to the estimated amount of the contract, with sureties to be approved by the Commissioners of the District of Columbia, will be required from all contractors, guaranteeing that their contract will be strictly and faithfully performed to the satisfaction of and acceptance by said Commissioners.

Contractors will promptly pay the workman who shall be employed by them upon the work under their contracts in cash current and not in what is denominated store pay or orders, and will from time to time, and as often as may be required by the Commissioners of the District of Columbia, furnish to said Commissioners satisfactory evidence that all persons who have done work or furnished materials have been paid as herein required; and if such evidence is not furnished, such sum or sums as may be necessary for such payment may, in the discretion of said Commissioners, be retained until such claims shall be fully satisfied.

No contract or any interest therein shall be transferred by the parties to whom the award is made. It is a condition of all contracts that such transfers will be null and void, and will cause the contract to be annulled and the work to be given to other parties under the conditions mentioned in paragraph 1 of these stipulations.

SPECIFICATIONS FOR CEMENT.

All tests shall be made by the methods and under the conditions prescribed by the committee of the American Society of Civil Engineers, and to be open to contractors.

NATURAL CEMENT.

[To be delivered in barrels to weigh 300 pounds net.]

(1) *Fineness*.—Not less than 92 per cent. to pass through a 50-mesh sieve, and not less than 82½ per cent. to pass through a 100-mesh sieve.

(2) *Time of setting*.—Initial set in not less than ten nor more than forty-five minutes, when mixed, from the 1st of June till the 1st of October, with the smallest possible

amount of water at the temperature at which it flows from the tap in the laboratory of the inspector of asphalts and cements at the time of mixing; and from the 1st of October to the 1st of June, when mixed with water at the temperature of the air in said laboratory, about 70° F.

(3) *Tensile strength*.—One day (in air till hard set, rest of day in water), neat, 30 pounds; 7 days (in air 1 day, in water 6 days), neat, 70 pounds; two parts sand, 20 pounds; 28 days (in air 1 day, in water 27 days), neat, 170 pounds; two parts sand, 50 pounds.

PORTLAND CEMENT.

[Barrels to weigh 400 pounds gross, average.]

(1) *Fineness*.—Not less than 95 per cent. to pass through a 50-mesh sieve, and not less than 85 per cent. to pass through a 100-mesh sieve.

(2) *Time of setting*.—Initial set in not less than one hour, when mixed with water under the same conditions as with natural cement, except where a quick cement is desired, which should set in less than ten minutes.

(3) *Tensile strength*.—1 day (in air till hard set, in water rest of day), neat 125 pounds; 7 days (in air 1 day, in water 6 days), neat 300 pounds; three parts sand, 100 pounds; 28 days (in air 1 day, in water 27 days), neat 400 pounds; three parts sand, 125 pounds.

All cements will be from time to time subjected to chemical analysis, and must show freedom from any foreign substances or deleterious matter, and that the elements are combined in proper proportion to secure the best results and insure permanency. Approximate quantities of cement needed at this letting: Natural cement, 16,000 barrels; Portland cement, 1,500 barrels.

GENERAL SPECIFICATIONS.

The District cement house is located on Canal street, between First street and Delaware avenue, southwest. This storehouse will be used for the storage of all cements purchased in pursuance of these specifications.

The cements named in the foregoing schedule are to be furnished and delivered at the storehouse mentioned in the preceding paragraph, and in such quantities as may be ordered by the Engineer Commissioner, and all must be of the quality accepted, and in strict conformity with the samples upon which the proposal is submitted. Bidders must submit with their proposals samples of cement which they propose to furnish, giving name of brand, name of manufacturer, and place of manufacture. The samples must be not less than 10 pounds in weight. Cements shall, as far as practicable, be delivered in sufficient time to enable a twenty-eight day test to be made of them before they are accepted, and a sufficient quantity must be kept on hand to meet all the requirements of the District. All cement rejected or condemned shall, upon order of the Engineer Commissioner, be immediately removed from the storehouse by the contractor, or it will be done by the District at his risk and expense. The amounts named are approximate estimates of the quantities required for the year ending June 30, 1891, but the right is reserved to order more or less of each item named. No award will be made except to bona fide dealers in the articles aforesaid. Bids will be addressed to the Commissioners, District of Columbia, and be so marked on the outside envelope as to indicate their contents. Proposals forwarded otherwise than by mail must be delivered to the secretary of the Board. The Commissioners reserve the right to reject any or all bids or parts of bids. Should the contractor fail to comply with the conditions of his contract, the Commissioners reserve the right to purchase the required articles in open market, at the expense of the contractor, or to annul the contract and withhold all money that may be due, or become due, and apply the same to the settlement of any increased expense to the District that may be consequent upon the contractor's failure.

- TABULAR STATEMENT OF STREET IMPROVEMENTS DONE UNDER CONTRACTS (CITY).
GENERAL SCHEDULE.

Date.	No. of contract.	Contractor.	Locality.	Square yards.	Price square yard.	Contract work.	Material.	Total cost.	Character of pavement.
1889.									
Aug. 8	1148	The Cranford Paving Co.	C street SE. and SW., from First to New Jersey avenue.	4,918.61	\$2.00	\$13,913.40	\$793.19	\$14,706.59	Asphalt.
Aug. 8	1148	do	Four-and-a-half street SW., from Missouri avenue to Maryland avenue.	4,833.16	2.00	14,740.09	4,238.39	18,978.48	Do.
Aug. 8	1148	do	New Hampshire avenue NW., from R to J.	8,808.84	2.00	20,336.43	2,600.37	22,936.80	Do.
Aug. 9	1152	M. F. Tally	Delaware avenue SW., from B to C...	2,394.46	.57	2,617.49	1,400.51	4,018.00	Macadam.
Aug. 9	1153	do	Pennsylvania avenue SE., from Eleventh to bridge.	20,147.23	.55	22,398.33	6,309.14	28,707.47	Do.
Aug. 12	1160	Barber Asphalt Paving Co. {	Seventeenth street NW., from Pennsylvania avenue to New York avenue.	624.85	1.20	12,383.16	320.96	12,684.12	Asphalt.
Aug. 12	1160	do	Fifteenth street NW., from Pennsylvania avenue to New York avenue.	4,847.07	2.00	13,409.62	.....	13,409.62	Do.
Aug. 12	1161	do	Thirty-fifth street NW., from Q to U...	5,400.00	2.00	13,266.90	3,308.45	16,575.35	Do.
Aug. 12	1162	do	North Capitol from I to K	2,673.79	2.00	6,111.67	216.00	6,327.67	Do.
Aug. 9	1167	P. Maloney	Maryland avenue NE., from Eleventh to Thirteenth.	8,268.53	2.00	19,706.72	2,259.19	21,965.91	Asphalt blocks.
Aug. 9	1167	do	North Carolina avenue from Third to Sixth.	5,032.66	2.00	12,356.34	94.26	12,450.60	Do.
		Total		72,167.73	.....	151,220.15	21,540.46	172,760.61	

* Incomplete.

GEORGETOWN SCHEDULE.

Date.	No. of contract.	Contractor.	Locality.	Square yards.	Price square yard.	Contract work.	Material.	Total cost.	Character of pavement.
1889.									
Aug. 12	1161	Barber Asphalt Paving Co.	Twenty-eighth street from P to Q	1,474.47	2.00	3,534.56	202.57	3,737.13	Asphalt.
Aug. 12	1161	do	Twenty-ninth street from P to Q	1,261.38	2.00	3,215.86	106.91	3,322.82	Do.
Aug. 12	1161	do	Thirty-third street from M to N	1,580.17	2.00	4,601.82	1,198.41	5,800.23	Do.
Aug. 12	1161	do	Thirty-third street from P to Thirty-second.	4,674.38	2.00	9,764.00	.....	9,764.00	Do.
Aug. 12	1161	do	Thirty-fourth street from M to N	1,629.61	2.00	4,120.62	837.30	4,957.92	Do.
Aug. 12	1161	do	Thirty-fifth street from Prospect to N.	1,017.00	2.00	2,855.44	491.01	3,346.45	Do.
Aug. 12	1161	do	Prospect street from Thirty-third to Thirty-fifth.	2,918.01	2.00	7,290.96	1,451.99	8,742.95	Do.
1890.									
May 24	1242	do	Thirty-fourth street from N to P	2,109.23	2.00	6,350.38	1,625.91	7,976.29	Do.
		Total		16,694.45	.....	41,739.64	5,914.10	47,653.79	

NORTHWEST SCHEDULE.

1889, July 31	1143	Andrew Gleason.....	Twenty-fifth street from New Hampshire avenue to K.	2,727.73	.70	5,176.86	580.06	5,756.92	Macadam.
Aug. 8	1146	Cranford Paving Co.....	L street from Twenty-sixth to Twenty-seventh.	1,173.67	2.00	2,670.63	687.32	3,357.95	Asphalt.
Aug. 8	1146	do.....	Q street from Fifth to Sixth.	832.87	2.00	2,082.37	5.94	2,088.31	Do.
Aug. 8	1146	do.....	Sampson street from Fourteenth to Fifteenth.	1,733.33	2.00	5,507.84	1,818.75	7,326.52	Do.
Aug. 8	1146	do.....	Kingman street from P to Q.	1,698.79	2.00	4,471.85	106.90	4,578.75	Do.
Aug. 8	1146	do.....	Q street from New Jersey avenue to Third.	1,606.97	2.00	4,993.63	1,523.88	6,517.51	Do.
Aug. 8	1146	do.....	L street from New Jersey avenue to North Capitol.	4,643.35	2.00	12,991.08	1,006.41	13,997.49	Do.
Aug. 8	1146	do.....	Twenty-first street from R to Bond.	1,483.01	2.00	4,063.85	1,126.56	5,189.91	Do.
Aug. 8	1146	do.....	Twelfth street from S to V.	4,732.27	2.00	14,537.45	4,331.79	18,869.24	Do.
Aug. 8	1146	do.....	Seventeenth street from R to T.	2,046.33	2.00	8,115.89	2,314.79	10,430.68	Do.
Aug. 8	1146	do.....	First street from I to K.	1,190.82	2.00	3,028.37	3,028.37	Do.
Aug. 8	1146	do.....	N street from Fifth to New Jersey avenue.	2,915.79	2.00	8,460.98	659.49	9,140.47	Do.
Aug. 8	1146	do.....	M street from New Jersey avenue to First.	2,597.37	2.00	6,371.25	339.58	6,710.83	Do.
Aug. 8	1146	do.....	S street from Sixteenth to New Hampshire avenue.	2,680.59	2.00	7,052.73	1,681.25	8,732.98	Do.
Aug. 8	1146	do.....	Twenty-fifth street from Pennsylvania avenue to M.	1,692.67	2.00	4,470.73	1,501.00	5,971.73	Do.
Aug. 12	1160	Barber Asphalt Paving Co	E street from Pennsylvania avenue to Fifteenth.	3,030.84	1.20	5,293.80	5,293.80	Asphalt on bituminous base.
Aug. 12	1161	do.....	Twenty-second street from M to O.	3,894.20	2.00	10,872.75	3,351.50	14,224.45	Asphalt.
Aug. 12	1162	do.....	Johnson street from R to S.	1,446.22	2.00	3,641.55	227.60	3,869.15	Do.
Aug. 12	1162	do.....	French street from Ninth to Tenth.	1,692.27	2.00	4,173.07	42.76	4,215.83	Do.
Aug. 12	1162	do.....	Marion street from P to R.	2,860.89	2.00	7,425.19	270.83	7,696.04	Do.
Aug. 12	1162	do.....	Madison street from M to N.	1,537.52	2.00	4,354.04	294.44	4,648.48	Do.
Aug. 12	1162	do.....	Ridge street from Fourth to Fifth.	2,818.02	2.00	8,013.84	930.08	8,943.92	Do.
Aug. 12	1162	do.....	Pierce street from North Capitol to New Jersey avenue.	4,863.38	2.00	13,867.92	1,333.32	15,191.24	Do.
Aug. 12	1162	do.....	Washington street from Fourth to Fifth.	2,128.11	2.00	6,281.28	1,878.07	8,159.35	Do.
Aug. 12	1167	P. Maloney.....	Four and-a-half street from Pennsylvania avenue to D.	3,030.84	2.00	5,293.80	5,293.80	Asphalt blocks.
Total				61,662.85	163,922.85	25,991.37	189,904.22	

Tabular statement of street improvements done under contracts (City)—Continued.

SOUTHWEST SCHEDULE.

Date.	No. of contract.	Contractor.	Locality.	Square yards.	Price square yard.	Contract work.	Material.	Total cost.	Character of pavement.
1889.									
Aug. 8	1149	Cranford Paving Company	H street from First to Third	3,711.15	\$2.00	\$9,470.76	\$2,784.12	\$12,254.88	Asphalt.
Aug. 9	1157	M. F. Talty	L street from Four and a-half to Water	3,134.47	.57	4,081.40	217.36	4,298.76	Macadam.
Aug. 9	1157	do	Second street from G to Delaware avenue.	3,886.33	.57	4,128.79	1,641.98	5,770.77	Do.
Aug. 9	1158	do	K street from First to Water	7,031.00	.57	10,323.73	1,569.64	11,893.37	Do.
Aug. 8	1149	Cranford Paving Company	Second street from Maryland avenue to F.	3,172.69	2.00	9,350.29	2,784.35	12,134.64	Asphalt.
Aug. 8	1149	do	D street from South Capitol to First	3,081.33	2.00	9,991.70	2,464.04	12,455.74	Do.
Aug. 12	1160	Barber Asphalt Paving Company.	Ninth street from B to C	1,453.73	1.30	2,092.13	186.38	2,278.51	Asphalt, bituminous base.
Oct. 25	1210	Andrew Gleeson.	Canal street from C to E	5,185.58	.79	6,126.78	11,410.67	17,537.45	Granite blocks.
		Total		32,162.43	.....	56,765.58	22,588.54	79,354.12	

SOUTHEAST SCHEDULE.

Date.	No. of contract.	Contractor.	Locality.	Square yards.	Price square yard.	Contract work.	Material.	Total cost.	Character of pavement.
1889.									
Aug. 2	1131	W. H. Mohler	Virginia avenue from Second to Third	1,926.06	75	2,942.83	363.56	\$3,306.49	Macadam.
Aug. 2	1131	do	South side Lincoln square	3,523.08	75	4,125.96	2,601.13	6,728.09	Do.
Aug. 3	1142	Andrew Gleeson	Third street from Virginia avenue to K	2,466.92	80	3,914.49	5,485.98	9,400.47	Granite blocks.
Aug. 9	1150	M. F. Talty	Ninth street from East Capitol to I	8,137.62	57	14,991.21	1,480.83	16,472.04	Macadam.
Aug. 9	1154	do	C street from Seventh to Eleventh	3,296.88	57	6,314.45	476.59	6,791.04	Do.
Aug. 12	1168	P. Maloney	C street from Sixth to Seventh	2,141.97	2.06	5,771.30	106.77	5,878.07	Asphalt blocks.
Aug. 12	1168	do	D street from Third to Sixth	3,859.27	2.00	9,670.64	897.92	10,568.56	Do.
Aug. 12	1168	do	Fourth street from Pennsylvania avenue to North Carolina avenue.	4,592.61	2.00	1,389.29	.....	1,389.29	Do.
Aug. 12	1168	do	D street from First to Third	4,393.53	2.00	11,127.53	134.40	11,261.93	Do.
Aug. 12	1168	do	Fifth street crossing square	693.07	2.00	1,043.44	.....	1,043.44	Do.
Aug. 12	1168	do	First street from C to D	1,260.65	2.00	3,134.98	496.10	3,631.08	Do.
		Total		32,291.64	.....	65,026.22	11,454.28	76,470.50	

TABULAR STATEMENT OF REPAIRS TO CONCRETE PAVEMENTS.

Repairing and resurfacing concrete pavements.

Date.	Contract.	Contractor.	Locality.	Asphalt.		Total cost.	Remarks.
1888.				<i>Squ. yds.</i>	<i>Cubic yds.</i>		
Aug. 11	947	H. L. Cranford.	Tenth street from G to I.	3,690.39	.....	\$5,413.45	Resurfacing.
Aug. 11	947	....do	Pennsylvania avenue from First to 7th.	69,299.83	.....	124,443.46	Do.
Aug. 11	947	....do	H street from Tenth to Thirteenth.	4,200.58	.....	5,912.39	Do.
Aug. 11	947	....do	S street from Fifteenth to Sixteenth.	1,757.30	.....	2,334.86	Do.
Aug. 11	947	....do	Fifteenth street at L.	515.76	.....	630.52	Do.
Aug. 11	947	....do	Twelfth street from F to G.	1,223.89	.....	1,533.64	Do.
Aug. 11	947	....do	K street from Fifth to Seventh.	3,145.81	.....	4,129.99	Do.
Aug. 11	947	....do	Eighteenth street from I. to M.	2,402.12	.....	3,634.36	Do.
Aug. 11	947	....do	L street from Twentieth to Connecticut avenue.	5,089.27	.....	7,103.33	Do.
Aug. 11	947	....do	East Capitol street from First to Ninth.	6,521.69	.....	11,304.43	Do.
Aug. 11	947	....do	Various .....	.....	2,153.62	43,392.04	Minor repairs
		Total .....	.....	97,846.64	2,153.62	209,832.47	

TABULAR STATEMENT OF WORK DONE ON COUNTY ROAD AND SUBURBAN STREETS.

Constructing county roads.

Date.	Contract.	Locality.	Square yards.	Price.	Cubic yards.	Price.	Contract work.	Material.	Total cost.	Character of work.
1889. Aug. 12	1162	Barber Asphalt Paving Company.								
Aug. 8	1146	Crauford Paving Company.	Fourteenth street, from Roanoke to Yale.	4,465.00	\$2.00		\$9,643.43	\$892.61	\$10,536.04	Asphalt.
July 3	1141	Andrew Gleason	Pomeroy street, from Sixth to Seventh.	590.27	2.00		1,583.65	297.10	1,880.75	Do.
July 3	1141	do	Eighteenth street extended.	5,923.79	.14		4,198.17	555.88	4,754.05	Gravel.
July 15	1085	John Dugan	Sheridan street, from Seventh to Ninth.	1,908.87	.85		2,553.98	278.90	2,832.88	Macadam.
July 12	1082	Albert Gleason	Massachusetts avenue extended.	16,399.74	.384		15,068.65	8,896.32	23,964.97	Do.
1890. June 24	1248	W. H. Mohler	Fourth street extended.			35,287.00	9,390.64		9,390.64	Grading.
Apr. 15	1234	Andrew Gleason	Brightwood avenue, from Florida avenue to Pomeroy street.	733.06	2.73		2,639.35		2,639.95	Granite blocks.
May 13	1240	do	Bunker Hill road.	8,984.00	.12		3,378.66	269.42	3,648.08	Gravel.
Feb. 26	1228	do	Pennsylvania avenue extended.			75,777.00	22,949.57	759.69	23,709.26	Grading.
		do	Canal.	15,445.55	.37		9,708.25	86.34	9,854.59	Macadam.
		Total	54,450.28			111,064.00	81,144.35	12,036.26	93,180.61	

CONTRACTS FOR GRADING STREETS, ALLEYS, AND ROADS.

Grading streets, alleys, and roads.

Date.	No. of contract.	Contractor.	Locality.	Cubic yards.	Price.	Total cost.
1889.						
Order		E. F. Riggs	Riggs street, from Sixteenth to Seventeenth.	400	<i>Cents.</i> 10	\$40.00
Aug. 9	1178	B. H. Warner, treas.	Philadelphia and Omaha.	10,000	10	1,000.00
Aug. 9	1185	H. Waters.	N street, NE. from North Capitol to First.	285	10	28.50
Sept. 5	1186	J. Paul	Adams street from North Capitol to First.	7,296	10	729.60
Sept. 18	1194	W. A. Fry	Steuben street from Seventh to Sherman avenue.	1,000	10	100.00
Oct. 2	1196	H. Burkhardt.	Patterson street from First to North Capitol.	4,000	10	400.00
Aug. 26	1180	R. M. Richards.	First street extension.	10,000	10	1,000.00
Aug. 31	1131	Blundon & Becker.	Bank street.	1,038.4	10	103.84
Oct. 24	1207	Washington Brick Machine Company.	M, N, and O streets, from Twelfth to Trinidad avenue.	3,640	10	364.00
Oct. 24	1209	T. L. Holbrook.	Vernon street from Eighteenth to Nineteenth.	7,000	10	700.00
Oct. 29	1212	Albert Gleeson.	Belmont Road.	3,600	10	360.00
Oct. 30	1213	H. R. Dulany, treasurer	Various	10,000	10	1,000.00
Oct. 24	1211	A. P. Fardon.	Wyoming street from Eighteenth to Nineteenth.	9,340	10	934.00
Oct. 30	1217	E. F. Beale.	Quincey and R streets	4,746	10	474.60
Nov. 21	1118	A. A. Thomas.	Quincey street.	10,000	10	1,000.00
Nov. 26	1219	C. B. Pearson.	New Hampshire avenue.	10,000	10	1,000.00
Nov. 26	1220	F. B. Noyes.	Sixth street extension	10,000	10	1,000.00
1890.						
Jan. 9	1223	G. Truesdell.	Second and Brentwood from R to T.	10,000	10	1,000.00
Jan. 8	1227	J. Paul	Buchanan street from First to North Capitol.	5,254	10	525.40
Apr. 5	1233	T. L. Holbrook.	California street from Eighteenth to Nineteenth.	5,000	10	500.00
Apr. 30	1238	C. H. Eslin	Fifteenth street NE.	4,000	10	400.00
June 12	1245	H. Barton	Omaha street.	4,000	10	400.00
Feb. 12	1222*	S. Casey	Square 673	5,000	10	500.00
Mar. 7	1231*	D. Knowlton	Half street, from M to N.	5,000	10	500.00
Apr. 22	1236*	F. S. Lamson	Galen street and Highview avenue.	3,000	10	300.00
Apr. 25	1237*	J. L. Barbour	Square 736	5,250	10	525.00
		Total		148,887		13,061.40

* Incomplete.

TABULAR STATEMENT OF SUPPLY CONTRACTS.

Supply contracts.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1077	July 9	R. Leitch & Sons.	Plumbers' material.
1086	July 9	H. McShane & Co.	Do.
1891	July 17	W. J. C. Dulaney	School books.
1092	July 17	do.	Stationery.
1093	July 17	Scheller & Stevens	Drugs.
1094	July 18	E. G. Wheeler	Plumbers' material.
1095	July 18	do.	Hardware.
1096	July 18	do.	Telegraph and telephone supplies.
1097	July 18	B. Rich & Sons	Boots and shoes.
1098	July 18	J. B. Bryan & Bro.	Groceries.
1100	July 19	Danenhower & Co.	Forage.
1102	July 20	J. C. Ergood & Co.	Groceries.
1104	July 22	W. B. Moses.	Furniture.
1107	July 23	R. A. Robbins	Plumbers' material.
1108	July 23	F. P. May & Co.	Hardware.

Supply contracts—Continued.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1109	July 23	Law Reporter Company	Blank forms and printing.
1110	July 24	Bryce & Marean	Telegraph and telephone supplies.
1111	July 24	Johnson Bros	Fuel.
1112	July 24	J. A. Baker	Plumbers' material.
1113	July 24	B. S. Adams	Blank forms and printing.
1114	July 26	W. H. Butler	Glass, paints, and varnish.
1115	July 27	Ballantyne & Son	Stationery.
1116	July 27	do	School books.
1117	July 27	Kennedy & Son	Fuel.
1118	July 27	Frank Hume	Groceries.
1119	July 27	do	Bacon and ham.
1120	July 25	R. A. Robbins	Telegraph and telephone supplies.
1121	July 25	do	Dry goods.
1122	July 25	do	Hardware.
1123	July 25	do	Stationery.
1124	July 27	F. Miller	Glass, paints, and varnish.
1125	July 29	M. W. Beveridge	Tinware.
1126	July 29	do	Furniture.
1129	July 30	J. S. Barber & Son	Groceries.
1130	July 30	Libby, Bittinger & Miller	Lumber.
1134	Aug.	Great Falls Ice Company	Ice.
1135	Aug.	Z. D. Gillman & Co	Drugs.
1136	Aug.	Lansburg & Bro.	Dry goods.
1137	July	Judd & Detweiler	Blank forms and printing.
1138	July 30	R. H. Willett	Lumber.
1139	July 31	R. I. Varnell	Fresh meat.
1140	July 31	do	Hams.
1144	Aug. 6	Woodward & Lothrop	Stationery.
1172	Aug. 14	do	Dry goods.
1187	July 2	G. White & Son	Lamp-posts and castings.
1192	Sept. 7	T. T. Keane	Fresh meat and corn beef.
1214	Oct. 25	B. Rich & Sons	Dry goods.
1215	Nov. 22	T. W. Smith	Lumber.

TABULAR STATEMENT OF MISCELLANEOUS CONTRACTS.

Miscellaneous contracts.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1072	July 3	H. I. Gregory	Furnish and set heating apparatus and Smead's dry-closet system in 3 schoolhouses.
1075	July 5	W. T. Garrison	Construct two-story and basement schoolhouse on Road street, Georgetown.
1076	July 8	G. T. Cumberland	Repairing police boat.
1083	July 13	United States Electric Lighting Co.	Furnish and maintain 181 electric lamps.
1101	July 19	E. L. Dent & Co	Construct a steam-heating and gas-fitting system at Industrial Home School.
1103	July 29	The Wheeler Reflector and Light Co.	Furnish and maintain oil lamps.
1106	July 22	William Rothwell	Construct two-story schoolhouse on Bowen road.
1127	Aug. 2	G. O. Cook	Construct two-story and basement schoolhouse on Stenben street.
1128	Aug. 2	J. H. Grant	Construct a two-story four-room schoolhouse on Nichols avenue.
1145	Aug. 7	Electric Heating and Power Co.	Maintain and erect incandescent electric lamps.
1164	Aug. 20	W. E. Hodge	Sprinkle and clean alloys.
1165	Aug. 14	J. H. Grant	Construct a one-story schoolhouse on Benning's road.
1173	Aug. 10	Springman Bros	Hauling cast-iron pipe and castings.
1174	Aug. 16	H. I. Gregory	Furnish and set ventilating apparatus and Smead's dry-closet system in two schoolhouses.
1175	Aug. 16	do	Furnish tinware.
1176	Aug. 23	C. T. Carter & Co	Furnish hardware.
1177	Aug. 23	Saml. B. Boyer	Construct brick stable at police station No. 9.
1179	Aug. 15	F. M. Draney	Remove garbage.
1181	Aug. 26	J. R. Young	Construct brick boiler house at Industrial Home School.

Miscellaneous contracts—Continued.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1184	Aug. 30	D. J. Macarty.....	Construct addition to Mott School building.
1193	Sept. 16	J. H. Howlett.....	Construct brick stable, retaining wall, etc., at 2 police stations.
1198	Oct. 5	Washington Gaslight Co ...	Furnish gas for and maintain street lamps.
1200	Oct. 4	Ballantyne & Son.....	Furnish school desks and chairs.
1204	Oct. 17	J. R. Young.....	Construct addition to police station No. 3.
1205	Oct. 17	... do	Construct addition to water closet at police station No. 5.
1206	Oct. 15	Clapp and Jones Manufacturing Co.	Furnish two steam fire engines.
1208	Oct. 24	Georgetown Gaslight Co....	Furnish gas for and maintain street lamps.
1216	Nov. 26	J. L. Parsons.....	Fit up and complete chemical laboratory in High School.
1221	Nov. 18	C. T. Halloway.....	Furnish chemical fire engine.
1226	Nov. 5	W. H. Houghton & Co.....	Furnish desks, chairs, and teachers' tables.
	1890.		
1229	Mar. 3	Wheeler Reflector and Light Co.	Furnish street lanterns.
1230	Mar. 30	J. B. Adams.....	Furnish school desks and chairs.
1243	June 10	Municipal Signal Co.....	Construct police signals, etc., in Georgetown.
1235	Apr. 21	Evening Star Newspaper Co.	Lay granolithic sidewalk.

TABULAR STATEMENT OF CONSTRUCTION-MATERIAL CONTRACTS.

Construction-material contracts.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1073	July 5	J. A. Hayden	750,000 vitrified bricks.
1074	July 22	Washington Brick Machine Co.	3,000,000 paving and 200,000 arch bricks.
1078	July 8	West Virginia Fire Brick Co.	250,000 vitrified bricks.
1079	Sept. 2	Sommerville & Sons	12, 15, 24 inches and 12 by 16 terra-cotta pipe.
1080	July 12	Shepherd & Hurley.....	Water valves.
1081	July 12	Samuel Emery.....	Circular curb.
1084	July 12	Maryland Pavement Co.....	300,000 asphalt blocks; 70,000 asphalt tile.
1087	July 15	H. McShane & Co.....	Water valves.
1088	July 12	McNeal Pipe and Foundry Co.	Cast-iron water pipes.
1089	July 15	Shields & Neelan	Granite curb and paving blocks.
1090	July 15	Virginia State Granite Co...	100,000 granite paving blocks.
1099	July 29	G. Richardson	Artificial stone tile.
1105	July 20	H. Lyles	Sand, gravel, and broken stone.
1132	Aug. 2	A. R. Williams.....	150 barrels of lime.
1133	Aug. 2	W. F. Hewitt.....	6,000 barrels of Portland cement.
1159	Aug. 12	Cumberland Hydraulic Cement Co.	6,000 barrels of Potomac cement.
1166	Aug. 12	T. P. Morgan.....	Riprap stone for Free Bridge.
1188	Sept. 2	Globe Sewer Pipe Co	Terra-cotta pipe.
1189	Sept. 2	American Sewer Pipe Co ...	Do.
1191	Sept. 3	A. Lamond.....	Do.
1199	Oct. 4	Samuel Emery.....	6 by 20 and 8 by 8 granite curb.
1201	Oct. 5	E. L. Dent.....	Fire and street hydrants.
	1890.		
1224	Jan. 21	Washington Brick Machine Co.	550,000 paving bricks.
			Vitrified tile.
1232	Feb. 12	J. A. Hayden	
1239	Apr. 30	J. M. Mack	600,000 vitrified bricks.
1241	May 14	Maryland Pavement Co.....	100,000 asphalt blocks.
1244	June 10	W. C. Lewis & Co.....	875 barrels of Portland cement.

TABULAR STATEMENT OF WORK DONE FOR RAILROAD COMPANIES.

Work done for railroad companies.

Company.	Locality.	Square yards.	Cubic yards.	Cost.
Washington and Georgetown Railroad.	Fourteenth street, northwest, from New York avenue to Boundary.	.....	23.36	\$396.82
Do.....	Pennsylvania avenue, from First to Twenty-sixth.	3,363.70	2.65	6,199.99
Do.....	Fifteenth street, from New York avenue to Pennsylvania avenue.	362.44	.07	947.35
Do.....	New York avenue, from Fourteenth to Fifteenth.	.....	.43	8.78
Do.....	Fourteenth street, from Florida avenue to Yale.	757.33	.....	2,776.98
Do.....	New Jersey avenue, from B to C.	.....	.03	.51
Do.....	Seventh street, from Pennsylvania avenue to C.	.....	.45	7.65
Metropolitan Railroad.....	Fourteenth street, from New York avenue to H.	.....	1.09	17.93
Do.....	East Capitol street, from First to Ninth	761.17	.....	1,313.71
Do.....	First street, from B to East Capitol.	.....	.85	4.08
Do.....	F street, from Seventh to Fourteenth.	.....	25.17	317.04
Do.....	New Jersey avenue, from C to D.	.....	.90	15.30
Do.....	Third street at D.	.....	.07	1.19
Do.....	H street, from Fifteenth to Vermont avenue.	.....	10.68	327.63
Do.....	Connecticut avenue and H.	.....	2.72	57.84
Do.....	Seventeenth and H streets.	.....	.28	4.76
Do.....	Pennsylvania avenue and Ninth street.	42.40	.....	70.26
Do.....	Ninth street, from I to K.	.....	.28	4.76
Do.....	Dupont Circle.	.....	4.04	117.35
Do.....	Delaware avenue, from B to C.	.....	.07	1.47
Do.....	P street, from Dupont Circle to Twentieth.	.....	.18	3.06
Do.....	Four and a-half street, from Missouri avenue to Maryland avenue.	493.70	.....	1,103.49
Capitol, O Street and South Washington Railroad.	G street, from First to Fourth.	.....	.61	10.37
Do.....	Eleventh street, from G to K.	.....	8.25	140.25
Do.....	O street, from Eighth to Eleventh.	.....	5.49	99.21
Do.....	Pennsylvania avenue, at First and Fourteenth.	53.93	2.39	135.11
Do.....	E street, from Ninth to Eleventh.	.....	1.62	30.97
Do.....	Fifth and P streets.	.....	.48	8.16
Do.....	Fourth and I streets.	.....	.42	7.14
Do.....	First street, from E to F.	.....	.45	7.65
Do.....	Bow street, from Twelfth to Fourteenth.	.....	.42	9.24
Do.....	Thirteenth and B streets.	.....	.23	3.91
Do.....	Massachusetts avenue and Eleventh street.	.....	1.26	21.42
Columbia Railroad.....	Massachusetts avenue, from Fourth and Seventh.	.....	2.88	54.80
Do.....	Eleventh street and New York avenue.	.....	11.85	387.98
Do.....	New York avenue, from Fourteenth to Fifteenth.	.....	.25	4.81
Do.....	H street, northeast, from First to Fifteenth.	1,364.05	.....	2,949.51
Eckington Railroad.....	.....	243.56	.....	531.64
Total.....	.....	8,806.33	109.92	17,920.12

TABULAR STATEMENT OF STREET IMPROVEMENTS DONE UNDER CONTRACTS (CITY.)
GENERAL SCHEDULE.

Date.	No. of contract.	Contractor.	Locality.	Square yards.	Price square yard.	Contract work.	Material.	Total cost.	Character of pavement.
1880. Aug. 8	1148	The Cranford Paving Co.	C street SE. and SW., from First to New Jersey avenue.	4,918.61	\$2.00	\$13,913.40	\$793.19	\$14,706.59	Asphalt.
Aug. 8	1148	do	Four-and-a-half street SW. from Mission avenue to Maryland avenue.	4,833.16	2.00	14,740.09	4,238.39	18,978.48	Do.
Aug. 8	1148	do	New Hampshire avenue NW., from B to L.	8,808.84	2.00	20,336.43	2,600.37	22,936.80	Do.
Aug. 9	1152	M. F. Talty	Delaware avenue SW. from B to C.	2,294.46	.57	2,617.49	1,400.51	4,018.00	Macadam.
Aug. 9	1153	do	Pennsylvania avenue SE., from Eleventh to bridge.	20,147.23	.55	22,398.33	6,309.14	28,707.47	Do.
Aug. 12	1160	Barber Asphalt Paving Co. {	Seventeenth street NW. from Pennsylvania avenue to New York avenue.	624.85	1.20	12,363.16	330.96	12,694.12	Asphalt.
Aug. 12	1160	do	Fifteenth street NW., from Pennsylvania avenue to New York avenue.	4,947.07	2.00	13,409.62	.....	13,409.62	Do.
Aug. 12	1161	do	Thirty-fifth street NW., from Q to U.	5,400.00	2.00	13,266.00	3,308.45	16,574.45	Do.
Aug. 12	1162	do	North Capitol from I to K.	2,673.79	2.00	6,111.67	216.00	6,327.67	Do.
Aug. 9	1167	P. Maloney	Maryland avenue NE., from Eleventh to Thirteenth.	8,268.53	2.00	19,706.72	2,239.19	21,945.91	Asphalt blocks.
Aug. 9	1167	do	North Carolina avenue from Third to Sixth.	5,032.06	2.00	12,356.34	94.26	12,450.60	Do.
		Total		72,167.73	.....	151,220.15	21,540.46	172,760.61	

* Incomplete.

GEORGETOWN SCHEDULE.

1880. Aug. 12	1161	Barber Asphalt Paving Co.	Twenty-eighth street from P to Q.	1,474.47	2.00	3,534.56	292.57	3,737.13	Asphalt.
Aug. 12	1161	do	Twenty-ninth street from P to Q.	1,261.38	2.00	3,215.86	106.91	3,322.82	Do.
Aug. 12	1161	do	Thirty-third street from M to N.	1,580.17	2.00	4,401.83	1,198.41	5,600.23	Do.
Aug. 12	1161	do	Thirty-third street from P to Thirty-second.	4,074.58	2.00	9,764.00	.....	9,764.00	Do.
Aug. 12	1161	do	Thirty-fourth street from M to N.	1,659.61	2.00	4,120.62	837.30	4,957.92	Do.
Aug. 12	1161	do	Thirty-fifth street from Prospect to N.	1,017.09	2.00	2,855.44	491.01	3,346.45	Do.
Aug. 12	1161	do	Prospect street from Thirty-third to Thirty-fifth.	2,918.01	2.00	7,296.96	1,451.99	8,748.95	Do.
1890. May 24	1242	do	Thirty-fourth street from N to P.	2,109.23	2.00	6,350.38	1,625.91	7,976.29	Do.
		Total		16,694.45	.....	41,739.64	5,914.10	47,653.70	

NORTHWEST SCHEDULE.

[illegible]

Tabular statement of street improvements done under contracts (City)—Continued.

SOUTHWEST SCHEDULE.

Date.	No. of con- tract.	Contractor.	Locality.	Square yards.	Price square yard.	Contract work.	Material.	Total cost.	Character of pavement.
1889. Aug. 8	1140	Cranford Paving Company	H street from First to Third	3,711.15	\$2.00	\$9,470.76	\$2,784.12	\$12,254.88	Asphalt.
Aug. 9	1157	M. F. Talty	L street from Four-and-a-half to Water	3,124.47	.57	4,691.40	217.30	4,908.70	Macadam.
Aug. 9	1157	do	Second street from G to Delaware ave- nue.	3,586.53	.57	4,128.79	1,041.98	5,170.77	Do.
Aug. 9	1158	do	K street from First to Water	7,931.00	.57	10,323.73	1,569.64	11,893.37	Do.
Aug. 8	1149	Cranford Paving Company	Second street from Maryland avenue to F.	3,172.69	2.00	9,350.29	2,784.35	12,134.64	Asphalt.
Aug. 8	1149	do	D street from South Capitol to First	3,981.33	2.00	9,991.70	2,464.04	12,455.74	Do.
Aug. 12	1160	Barber Asphalt Paving Company.	Ninth street from B to C	1,453.73	1.20	2,092.13	186.38	2,278.51	Asphalt, bituminous base.
Oct. 25	1210	Andrew Gleeson	Canal street from C to E	5,185.58	.79	6,126.78	11,410.67	17,537.45	Granite blocks.
		Total		32,102.43	.....	56,765.88	22,588.54	79,354.12	

SOUTHEAST SCHEDULE.

1889. Aug. 2	1131	W. H. Mohler	Virginia avenue from Second to Third	1,926.06	75	2,942.93	363.56	\$3,306.49	Macadam.
Aug. 2	1131	do	South side Lincoln square	3,523.09	75	4,125.90	2,601.13	6,728.09	Do.
Aug. 3	1142	Andrew Gleeson	Third street from Virginia avenue to K	2,466.02	80	3,914.40	5,485.98	9,400.47	Granite blocks.
Aug. 9	1150	M. F. Talty	Ninth street from East Capitol to I	8,137.62	57	14,991.21	1,480.83	16,472.04	Macadam.
Aug. 9	1154	do	C street from Seventh to Eleventh	3,296.88	57	6,314.45	476.59	6,791.04	Do.
Aug. 12	1168	P. Maloney	C street from Sixth to Seventh	2,141.07	2.06	5,771.30	106.77	5,878.07	Asphalt blocks.
Aug. 12	1168	do	D street from Third to Sixth	3,859.27	2.00	9,670.04	367.92	9,978.56	Do.
Aug. 12	1168	do	Fourth street from Pennsylvania av- enue to North Carolina avenue.	5,692.51	2.00	1,389.29	.....	1,389.29	Do.
Aug. 12	1168	do	D street from First to Third	4,393.53	2.00	11,127.53	134.40	11,261.93	Do.
Aug. 12	1168	do	Fifth street crossing square	693.07	2.00	1,643.44	.....	1,643.44	Do.
Aug. 12	1168	do	First street from C to D	1,290.65	2.00	3,134.98	496.10	3,631.08	Do.
		Total		32,291.64	.....	65,026.22	11,454.28	76,477.50	

NORTHEAST SCHEDULE.

1880.	Cranford Paving Company.	Third street from C to F	4,313.92	2.00	9,585.83	Asphalt.
Aug. 8	1149	K street from North Capitol to First.	4,138.17	2.00	11,541.79	Do.
Aug. 8	1149	I street from North Capitol to First.	2,922.63	2.00	8,135.76	Do.
Aug. 8	1151	Twelfth street from H to Boundary	3,543.06	.57	1,912.07	Macedam.
Aug. 9	1151	M. F. Tally	1,776.90	.57	1,739.20	Do.
Aug. 9	1155	I street from Sixth to Seventh	3,782.85	.57	798.98	Do.
Aug. 9	1156	D street from Massachusetts avenue to Maryland avenue.	875.07	2.00	2,049.33	Asphalt blocks.
Aug. 12	1163	Fifth street from C to D	2,300.22	2.00	5,722.67	Do.
Aug. 12	1168	A street from Seventh to Ninth	1,423.77	2.00	4,919.11	Asphalt.
Aug. 12	1162	M. F. Tally	2,933.61	2.00	7,420.32	Do.
Aug. 12	1162	G street from North Capitol to First.	12,990.73	2.00	32,590.30	Do.
Aug. 12	1162	H street (S. side) from First to Boundary.	40,602.93	2.00	106,033.18	Do.
		Total				

SPECIAL SCHEDULE.

Aug. 12	1160	Barber Asphalt Paving Co.	Twentieth street from R to S.....	1, 994. 64	2. 00	4, 438. 13	1, 170. 50	5, 606. 63	Asphalt.
Aug. 12	1161	do	S street from Connecticut avenue to Twentieth.	1, 076. 85	2. 00	2, 859. 43	787. 14	3, 646. 59	Do.
		Total		3, 071. 49	....	7, 295. 56	1, 957. 64	9, 253. 22	

Miscellaneous contracts—Continued.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1184	Aug. 30	D. J. Macarty.....	Construct addition to Mott School building.
1193	Sept. 16	J. H. Howlett.....	Construct brick stable, retaining wall, etc., at 3 police stations.
1198	Oct. 5	Washington Gaslight Co ...	Furnish gas for and maintain street lamps.
1200	Oct. 4	Bailantyne & Son.....	Furnish school desks and chairs.
1204	Oct. 17	J. R. Young.....	Construct addition to police station No. 3.
1205	Oct. 17	... do	Construct addition to water closet at police station No. 5.
1206	Oct. 15	Clapp and Jones Manufacturing Co.	Furnish two steam fire engines.
1208	Oct. 24	Georgetown Gaslight Co....	Furnish gas for and maintain street lamps.
1216	Nov. 26	J. L. Parsons.....	Fit up and complete chemical laboratory in High School.
1221	Nov. 18	C. T. Halloway.....	Furnish chemical fire engine.
1226	Nov. 5	W. H. Houghton & Co.....	Furnish desks, chairs, and teachers' tables.
	1890.		
1229	Mar. 3	Wheeler Reflector and Light Co.	Furnish street lanterns.
1230	Mar. 30	J. B. Adams.....	Furnish school desks and chairs.
1243	June 10	Municipal Signal Co.....	Construct police signals, etc., in Georgetown.
1235	Apr. 21	Evening Star Newspaper Co.	Lay granolithic sidewalk.

TABULAR STATEMENT OF CONSTRUCTION-MATERIAL CONTRACTS.

Construction-material contracts.

No. of contract.	Date.	Contractor.	Description.
	1889.		
1073	July 5	J. A. Hayden	750,000 vitrified bricks.
1074	July 22	Washington Brick Machine Co.	3,000,000 paving and 200,000 arch bricks.
1078	July 8	West Virginia Fire Brick Co.	250,000 vitrified bricks.
1079	Sept. 2	Sommerville & Sons	12, 15, 24 inches and 12 by 16 terra-cotta pipe.
1080	July 12	Shepherd & Hurley.....	Water valves.
1081	July 12	Samuel Emery.....	Circular curb
1084	July 12	Maryland Pavement Co.....	300,000 asphalt blocks; 70,000 asphalt tile
1087	July 15	H. McShane & Co.....	Water valves.
1088	July 12	McNeal Pipe and Foundry Co.	Cast-iron water pipes.
1089	July 15	Shields & Neelan	Granite curb and paving blocks.
1090	July 15	Virginia State Granite Co...	100,000 granite paving blocks.
1099	July 20	G. Richardson	Artificial stone tile.
1105	July 20	H. Lyles	Sand, gravel, and broken stone.
1132	Aug. 2	A. R. Williams.....	150 barrels of lime.
1133	Aug. 2	W. F. Hewitt.....	6,000 barrels of Portland cement.
1159	Aug. 12	Cumberland Hydraulic Cement Co.	6,000 barrels of Potomac cement.
1166	Aug. 12	T. P. Morgan.....	Riprap stone for Free Bridge.
1188	Sept. 2	Globe Sewer Pipe Co	Terra-cotta pipe.
1189	Sept. 2	American Sewer Pipe Co ...	Do.
1191	Sept. 3	A. Lamond.....	Do.
1199	Oct. 4	Samuel Emery.....	6 by 20 and 8 by 8 granite curb.
1201	Oct. 5	E. L. Dent.....	Fire and street hydrants.
	1890.		
1224	Jan. 21	Washington Brick Machine Co.	550,000 paving bricks.
			Vitrified tile.
1232	Feb. 12	J. A. Hayden	
1239	Apr. 30	J. M. Mack	600,000 vitrified bricks.
1241	May 14	Maryland Pavement Co.....	100,000 asphalt blocks.
1244	June 10	W. C. Lewis & Co.....	875 barrels of Portland cement.

TABULAR STATEMENT OF WORK DONE FOR RAILROAD COMPANIES.

Work done for railroad companies.

Company.	Locality.	Square yards.	Cubic yards.	Cost.
Washington and Georgetown Railroad.	Fourteenth street, northwest, from New York avenue to Boundary.	.....	23.36	\$396.82
Do.....	Pennsylvania avenue, from First to Twenty-sixth.	3,363.70	2.65	6,199.99
Do.....	Fifteenth street, from New York avenue to Pennsylvania avenue.	302.44	.07	947.35
Do.....	New York avenue, from Fourteenth to Fifteenth.	.....	.43	8.78
Do.....	Fourteenth street, from Florida avenue to Yale.	757.33	.....	2,776.98
Do.....	New Jersey avenue, from B to C.	.....	.03	.51
Do.....	Seventh street, from Pennsylvania avenue to C.	.....	.45	7.65
Metropolitan Railroad.....	Fourteenth street, from New York avenue to H.	.....	1.09	17.93
Do.....	East Capitol street, from First to Ninth	761.17	.....	1,313.71
Do.....	First street, from B to East Capitol.	.....	.85	4.08
Do.....	F street, from Seventh to Fourteenth.	.....	25.17	317.04
Do.....	New Jersey avenue, from C to D.	.....	.90	15.30
Do.....	Third street at D.	.....	.07	1.19
Do.....	H street, from Fifteenth to Vermont avenue.	.....	10.68	327.63
Do.....	Connecticut avenue and H	.....	2.72	57.84
Do.....	Seventeenth and H streets	.....	.28	4.76
Do.....	Pennsylvania avenue and Ninth street.	42.40	.....	70.26
Do.....	Ninth street, from I to K	.....	.28	4.76
Do.....	Dupont Circle	.....	4.04	117.35
Do.....	Delaware avenue, from B to C	.....	.07	1.47
Do.....	P street, from Dupont Circle to Twentieth.	.....	.18	3.06
Do.....	Four-and-a-half street, from Missouri avenue to Maryland avenue.	493.70	.....	1,103.49
Capitol, O Street and South Washington Railroad.	G street, from First to Fourth.	.....	.61	10.37
Do.....	Eleventh street, from G to K.	.....	8.25	140.25
Do.....	O street, from Eighth to Eleventh.	.....	5.49	99.21
Do.....	Pennsylvania avenue, at First and Fourteenth.	53.93	2.39	135.11
Do.....	E street, from Ninth to Eleventh	.....	1.62	30.97
Do.....	Fifth and P streets	.....	.48	8.16
Do.....	Fourth and I streets	.....	.42	7.14
Do.....	First street, from E to F	.....	.45	7.65
Do.....	Bow street, from Twelfth to Fourteenth	.....	.42	9.24
Do.....	Thirteenth and B streets	.....	.23	3.91
Do.....	Massachusetts avenue and Eleventh street.	.....	1.26	21.42
Columbia Railroad	Massachusetts avenue, from Fourth and Seventh.	.....	2.88	54.80
Do.....	Eleventh street and New York avenue.	.....	11.85	387.98
Do.....	New York avenue, from Fourteenth to Fifteenth.	.....	.25	4.81
Do.....	H street, northeast, from First to Fifteenth.	1,364.05	.....	2,949.51
Eckington Railroad	.....	243.56	.....	531.64
Total	.....	8,806.33	109.92	17,920.12

TABULAR STATEMENT OF MAIN AND PIPE SEWERS LAID BY DAY LABOR.

Work done by day labor, main and pipe sewers.

Location.	Pipe sewers laid (length in feet).							Manholes.	Branches.	Basins.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.
	6 inch.	8 inch.	12 inch.	15 inch.	18 inch.	21 inch.	24 inch.							
Delaware avenue and Canal street, SW										1	\$37.13	\$24.21	\$12.12	\$73.46
Florida avenue, between First and New York avenue, NE		72								2	91.81	75.03	18.10	184.94
Massachusetts avenue, NE, front of No. 328*				30						1	27.12	16.36	22.36	65.84
Maryland avenue and E street, NE			21											
Missouri avenue, between Four-and-a-half and Sixth street, NW								1			54.24	11.17	18.70	84.11
New Hampshire avenue and Twentieth street, NW			255					3	13		180.71	150.23		330.94
New Hampshire avenue and Dupont Circle			425					3	9		297.89	298.29		596.18
New Hampshire avenue and R street, NW†								1		1	14.00			14.00
Pennsylvania avenue and Sixth street, NW								1			16.00	5.11	4.37	25.48
Pennsylvania avenue, between Third and Four-and-a-half streets, NW														
Pennsylvania avenue, between Ninth and Tenth streets, NW	18							1			912.83	190.70	564.30	1,667.83
Rhode Island avenue, between Marion and Seventh streets, NW							237			1	534.81	110.24	397.13	932.18
Bank alley, Georgetown.		8	24					1			15.61	20.49	4.66	40.76
Bridge street, between Thirty-fifth and Thirty-sixth streets, NW			203					1	14		192.63	115.18	1.08	309.19
Capital street, between Delaware avenue and South streets, NW											51.06			51.06
Capital street														
Capital street and Delaware avenue, SW	54	30						1		1	38.00	16.56	16.67	71.23
C between Ninth and Tenth streets, NE								2		2	27.38	1.79	21.58	50.66
C between Eleventh and Twelfth streets, SE										1	20.81	6.34	16.95	44.10
C between Eleventh and Twelfth streets, SE			72	303			291	2	32		1,076.37	342.26	337.45	1,775.98
C between Twelfth and Thirtieth streets, SW			63					1	7		583.68	102.39	73.01	738.98
C street, SW, crossing Delaware avenue			123		76			3						
D street, between Maryland and Massachusetts avenues, NE§											9.75	.99	2.80	13.54
D street, between Eighth and Ninth streets, NE			212					2	10		157.86	123.76		281.62
D street, between Sixth and Seventh streets, SW										1	31.91	33.58	7.76	71.65
F street, between Sixth and Seventh streets, SW			132					1			108.64	53.02	32.86	194.42
I street, between North Capitol and First streets, NE			3							1	13.81	13.34	5.55	34.70
I street, between Sixth and Seventh streets, SW			318					2	6		326.84	173.77		500.61
Myrtle, between North Capitol and First streets, NE			21							1	27.60		40.42	68.02
Market Space, Georgetown			97					1	5		467.41	62.81	18.27	548.49
M street, between Eleventh and Twelfth streets, SE||											22.37			22.37

North Capitol and Myrtle streets, NW	81			4	131.50	70.08	110.13	312.40
First and I streets, NE								73.15
First and K streets, NE								49.83
North Capitol and O streets								209.68
V. between Fourteenth and Fifteenth streets, NW								354.51
First street, between B and C streets, SW	30			2	128.00	20.33	61.35	301.07
First and Carroll streets, SE	132	09		1	221.32	70.56	62.63	6.60
First street, between G and H streets, SW	282			2	155.55	145.52		694.58
Fourth street, between East Capitol and B streets, NE								148.52
Fourth street, between P and Q streets, NW	555			3	411.97	282.61		370.45
Q street, between Third and Fourth streets, NW	51			1	56.43	25.47	66.62	106.78
Four-and-a-half street and Pennsylvania avenue, NW	230			1	226.49	105.38	33.53	116.01
Four-and-a-half street and Maryland avenue, SW		63		1	73.25	21.74	52.08	110.59
Sixth and B streets, SE			27	1	42.10	29.27	4.99	69.51
Sixth and M streets, SE	51			2	59.69	34.90	12.73	304.28
Seventh and F streets, SW	3			1	29.62	7.62		270.41
Seventh and H streets, NE	18			1	16.25			33.32
Eighth and F streets, NW	242			2	214.75	149.63	10.82	81.69
Eighth, between East Capitol and A streets, SE	241			1	166.50	113.91	7.73	311.24
Ninth, between I and K streets, NE								82.36
Tenth street between New York avenue and K street, NW	36			1	22.60			34.19
Twelfth and O streets, NW	51			1	61.25	9.73	10.71	202.66
Fifteenth street, between Rhode Island avenue and O street, NW	249			1	192.33	118.91		431.65
Eighteenth street and Florida avenue, NW	18			1	38.98	35.65		87.57
Eighteenth street, between New York avenue and E street, NW								30.10
Twenty-second street and Massachusetts avenue, NW	36			1	113.93	51.47	37.26	131.62
Alley, reservation 10		214		1	246.52	163.70	21.43	66.71
Alley, square—								83.95
49	36			1	46.13	21.23	20.21	48.73
53				1	68.87	9.97	3.26	1.00
58	99			1	60.94	57.05	13.63	46.25
104	27			1	33.37	16.73	16.61	8.75
177	15			1	44.24	24.48	17.23	8.77
214	6			1	26.56	8.75	13.42	3.22
305	3			1	19.59		13.37	1.98
361	47			1	23.68	21.57	11.99	45.51
361				1	37.24	21.06		45.51
449	6			1	8.75			53.23
475	0			1	23.81	8.77	12.83	30.10
518				1	30.57	10.44	3.22	16.87
543				1	11.25	1.98		

* Examining sewer connection.

† Moving basin to new line.

Payling over sewer.

Readjusting four basins.

Locating starting point for contractor.

†† Cleaning sewer for contractor.

++ Material furnished by surface department.

!! Moving water main out of way of sewer.

!!! Removing basin from private property.

§§ Abandoning basin.

Work done by day labor, main and pipe sewers—Continued.

Location.	Pipe sewers laid (length in feet).							Manholes.	Branches.	Basins.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.
	6-inch.	8-inch.	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.							
Alley square—Continued.			168					2	24	1	\$175.10	\$140.40	\$3.88	\$319.38
620			6					1		1	19.31	10.93	19.17	49.41
624			9					2			21.45	1.98	23.35	46.78
630			6								11.75	3.24	16.21	31.20
676			9							1	46.87	20.18	26.64	93.69
759			3							2	32.11	26.97	5.30	75.38
839			36							1	37.93	29.51	7.48	74.92
866										1	6.75			6.75
Property yard, reservation 17														
Total	132	220	4,629	426	359	27	1,032	51	195	48	8,838.30	3,855.06	2,344.13	15,037.49

* Moving, unloading, and storing pipe.

TABULAR STATEMENT OF SUBURBAN SEWERS LAID UNDER CONTRACT.
Contract work—Appropriation for construction of suburban sewers.

No.	Contractor.	Location.	Size of sewer.	Length.	Price per foot.	Excavation.			Masonry.			Lumber left in trench.	Rock excavation.	Cost of work.	Extra work.	Amount paid contractor.	Cost of material.	Cost of inspection.	Total cost.
						Excess.	Deficit.		Excess.	Deficit.	Concrete.								
1195	J. J. Cudmore ..	California, Connecticut, and Wyoming avenues, NW.	12-inch.....	<i>Feet.</i> 1,789.0	\$0.79	\$38.12				\$3.51				\$1,435.92		\$1,435.92	\$436.70	\$73.56	\$1,946.18
1195	....do.....	Trumbull and Sixth streets, NW.	12-inch.....	935.0	.79	\$44.37				14.04				680.24	\$4.74	684.98	205.50	35.09	926.57
1195	....do.....	Wilson street, east of Linden street, NW.	12-inch.....	251.0	.79		6.32			7.18				184.79		184.79	56.18	9.47	250.44
		Total		2,975.0		96.12	50.69			24.73				2,300.95	4.74	2,305.69	699.38	118.12	3,123.19
1170	....do.....	Linden between Maple and Wilson streets, NW.	18-inch.....	907.5	1.07	253.65		26.08						1,281.35	8.29	1,289.64	412.55	66.08	1,708.27
1183	W. H. Mohler...	Eighth street extended, Grant avenue to Irving street.	24-inch.....	700.0	1.35		21.15			4.70				919.15		919.15	711.34	47.10	1,677.59
1202	P. H. Sugrue....	Shannon Place extended, Anacostia, Nichols avenue to Washington and Point Lookout R. R.	Brick and concrete, 2.50 by 3.75 feet.	556.0	3.94		77.73			20.59	\$704.00	\$43.12		2,839.44		2,839.44	60.07	145.47	3,044.98
1197	Andrew Gieson, son.	Rock Creek Valley from P. street to Lyon's Mill.	Brick, 2.75 by 4.125 feet.	1,223.6	4.60									5,628.56	1,570.57	7,199.13		368.83	7,567.96
1171	James McCandlish.	Superior street, Champlain to Meridian avenues.	Brick and concrete, 3 by 4.5 feet.	1,351.0	4.45		160.19			25.96				5,825.80	227.38	6,053.18	248.93	310.11	6,612.22
1171	....do.....	First street NW., S to U streets.	Concrete, 7.64 feet diameter.	684.1	9.90		1.14			3.09	2.73	4.17		5,761.73	5.92	5,767.65	1.84	235.48	6,004.97
		Total					161.33			3.09	25.96	2.73	4.17	11,587.53	233.30	11,820.83	250.77	605.59	12,077.19

Contract work—Appropriation for construction of suburban sewers—Continued.

No	Contractor.	Location.	Size of sewer.	Length.	Price per foot.	Excavation.		Masonry.			Lumber left in trench.	Rock excavation.	Cost of work.	Extra work.	Amount paid contractor.	Cost of material.	Cost of inspection.	Total cost.
						Excess.	Deficit.	Excess.	Deficit.	Concrete.								
1182	M. F. Tally	Champlain avenue...	Brick and concrete, 3.25 by 4.875 feet.	<i>Feet.</i> 559.0	\$4.90	.....	\$7.79	.....	\$11.48	.....	.....	.....	\$4,189.53	\$2,017.88	\$6,207.71	\$194.27	\$218.02	\$6,720.00
1182	....do	Adams and Jefferson streets, Anacostia.	Brick and concrete, 3.25 by 4.875 feet.	578.4	4.90	.....	86.55	.....	7.86	.....	.....	.....	2,739.76	106.12	2,845.87	127.06	145.79	3,118.72
		Total		1,437.4		.....	94.34	.....	19.34	.....	.....	.....	6,929.58	2,124.00	9,053.58	321.33	463.81	9,838.72

Work done by day labor—Appropriation for construction of suburban sewers.

Location.	Pipe sewers laid (length in feet).					Manholes.	Basins.	Branches.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.
	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.							
Champlain avenue ¹									\$477.15			\$477.15
Do ²							1		20.83		\$14.74	35.63
Connecticut and Kalorama avenues ³									55.62			55.62
Grant avenue and Eighth street ⁴									36.49			36.49
Kennesaw avenue, between Fourteenth and Sixteenth streets.....	351					2		12	263.41	\$27.20	115.46	408.07
Sherman avenue ⁵									49.76	14.15	18.19	77.09
Do ⁶		9	39		18				173.48	19.03	40.21	232.72
Do ⁷									15.72			15.72
Seventh street and Grant avenue, and Eighth street and Grant avenue.....					33	1	4		435.16	80.21	63.50	578.87
Eighteenth street extended, between Florida and Wyoming avenues.....		9		699		6		23	1,290.63	264.12	762.51	2,317.26
Nineteenth street extended, between Florida and California avenues.....		323	433			5		9	1,304.33	168.30	376.11	2,848.74
Adams street, Anacostia ⁸									18.37			18.37
Navy street, Anacostia ⁹							1		78.31	2.50	8.08	88.99
Shannon Place and Nichols avenue, Anacostia ¹⁰									79.24	41.43	33.97	154.64
Total.....	351	341	472	699	51	14	6	49	4,263.55	557.94	1,429.58	6,251.07

¹ Repairing old dam.² Wooden basin at sand crib.³ Repairing 24-inch sewer.⁴ Repairing bottom of sewer.⁵ Repairing old dam, etc.⁶ Constructing inlets to sewer.⁷ Cleaning mouth of sewer.⁸ Constructing inlet to sewer.⁹ Constructing wooden basin.¹⁰ Connecting sewer with culvert.

TABULAR STATEMENT OF REPLACING OBSTRUCTED SEWERS, LAID UNDER CONTRACT.

Contract work—Appropriation for replacing obstructed sewers.

No.	Contractor.	Location.	Size of sewer.	Length.	Price per foot.	Ex- ces- sion excess.	Masonry.		Lum- ber left in trench.	Cost of work.	Extra work.	Amount paid con- tractor.	Cost of mate- rial.	Cost of inspec- tion.	Total cost.
							Ex- ces- sion.	Con- crete.							
1188	W. H. Mohler.....	T street, NW., between Twelfth and Thirteenth streets.	Inches. 24	Feet. 515.3	\$1.35	\$55.67	\$17.76	\$0.00	\$34.26	*\$802.12	\$2.33	\$804.35	\$538.83	\$60.00	\$1,403.18

* \$10.23 deducted for two manhole frames, covers, and irons less than specification requirements.

From some of my notes. - Appropriation for replacing cast-iron sewers.

Location.	Pipe sewers relaid (length in feet.)				Manholes.	Branches.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.	Total length of pipe relaid.
	12-inch.	15-inch.	18-inch.	24-inch.							
Pennsylvania avenue, between Third and Four-and-a-half streets, NW.				296	2	12	\$498.51	\$16.13	\$349.93	\$864.57	296
A street, between Third and Fourth streets, NE.							10.37			10.37	
B street, between Third and Fourth streets, NE.	167						139.22	2.14	35.80	177.16	167
D street, crossing First street, NE.		70			1		77.92	12.09	39.30	129.91	70
I street, between Eighth and Ninth streets, NW.	223				6		253.83	29.60	75.50	359.02	223
East Capitol, between Tenth and Eleventh streets (N. side).	90				3		43.00		36.94	79.94	90
G street, between Eighth and Ninth streets, NW.							12.15			12.15	
H street, between Third and Fourth streets, NW.		126			3		215.01		24.55	239.56	126
I street, between North Capitol and First streets, NE.			579		1	27	634.11	160.64	303.30	1,107.05	579
K street, between Fifteenth and Sixteenth streets, and Sixteenth street between K and L streets, NW.		551			1	19	765.98		341.57	1,107.55	551
O street, between Fifteenth and Sixteenth streets, NW.			340				28.71			28.71	
T street, between Fourteenth and Fifteenth streets, NW.							813.36	33.35	85.47	932.18	340
First street, between B and C streets, NE.		612			3	23	574.68	142.17	224.65	941.50	612
Fourth street, between D and E streets, SE.	77						97.20		15.17	112.37	77
Four-and-a-half street, between H and I streets, SW.	150				1	9	184.05	28.48	83.04	295.57	150
Sixth street, between E and F streets, SW.	249				1	10	257.82	14.45	106.64	388.91	249
Seventh street, between B street, NW and B street, SW.			1,460		2		1,289.26	9.34	443.60	1,742.20	1,460
Seventh street, from Florida avenue northward.							17.06			17.06	
Eleventh street, between Virginia and Maryland avenues, SW.	336				9		153.13	23.48	80.88	257.49	336
Eleventh street, between South Carolina avenue and D street, SE.		407			3	13	330.97	30.56	211.88	583.41	407
Fifteenth street, between K and L streets, NW.	27						50.90		10.47	61.46	27
Sixteenth street, between L and M streets, NW.		648			1	34	1,870.02	238.52	339.91	2,438.45	648
Alley square 127.	87						71.45		23.22	94.67	87
Alley square 366.		63					100.86		30.75	131.61	63
Alley square 623.	218				1	18	501.32	55.60	93.08	650.00	218
Total.	1,613	2,477	2,379	296	17	186	8,900.98	790.15	2,985.74	12,742.87	6,765

TABULAR STATEMENT

PERMIT SEWERS.

No. of order.	Location.	Pipe sewers laid (length in feet).					Concrete. 250 by 3.75 feet.	Manholes built.	Basins built.	Branches used.
		6-inch.	8-inch.	12-inch.	15-inch.	18-inch.				
166	Anacostia, lot 5, Chichester				45		75			
82	Connecticut avenue, between K and L streets, NW.			88				1		
28	Florida avenue, between Seventh and Bohrer streets.			108				2		
47	Florida avenue, between Sixth and Larch streets.			84				1		
102	Florida avenue, between Seventh and Bohrer street.			14						
110	Florida avenue, between Sixth and Larch streets.		96					1		
125	Florida avenue, between Sixth and Larch streets.		43							2
165	Florida avenue, between Larch and Linden streets.		46					1		2
25	{ Georgia avenue, between Ninth and Tenth streets.		134	105				2		12
51	{ Tenth, between L and M streets, SE.									
83	Harewood avenue, between Florida and Maple avenues.			208				1		5
127	North Carolina avenue, between Ninth and Tenth streets, SE.		29					1		1
30	New Hampshire avenue, between H and I streets, NW.			118½				1		9
57	New Jersey avenue, between E and F streets, NW.		105							3
46	New York avenue, between Twenty-first and Twenty-second streets, NW.			275				3		16
75	Oregon avenue.			263				2		28
23	Pennsylvania avenue, between Twenty-fifth and Twenty-sixth streets, NW.			80						3
17	South Carolina avenue, between Twelfth and Thirteenth streets, SE.		60							3
39	Vermont avenue, between Q and R streets NW.			102				1		10
72	{ Wyoming avenue, between Eighteenth and Nineteenth streets.	480		752				4		21
131	{ Vernon avenue, between Eighteenth and Nineteenth streets	315		504				3		14
155	{ California avenue, between Eighteenth and Nineteenth streets.	282		613				3		24
123	C between Seventh and Eighth streets, NE.			51						3
132	C between Second and Third streets, NW.			72				1		6
61	C between 10 and 11 streets, NE.			133				1		2
122	D between Seventh and Eighth streets, NE.			26						1
112	E between Eighth and Ninth streets, NE.			75				1		3
99	E between Sixth and Seventh streets, NE.			160				1		5
136	E between Thirteenth and Thirteenth-and-a-half streets, SW.			52				1		2
170	F between Third and Fourth streets, NE.		40							2
81	F between Fifth and Sixth street, NE.			140				2		7
91	{ Alley, square 835		58	200				3		11
68	F between Fifth and Seventh streets, NW.			411				3		9
34	F between Sixth and Seventh streets, NW.			69						3
137	Franklin between New Jersey avenue and Fifth street, NW.			40						2
10	G between Tenth and Eleventh streets, SE.			39						2
43	H between Seventh and Eighth streets, SW.			99				1		4
141	H street, NW., front of No. 417.		12							1
20	H street, between Seventeenth and Eighteenth streets, NW.			132				1		2
15	I street, between Twelfth and Thirteenth streets, NE.									
37	{ Thirteenth street between I street and Florida avenue, NE.			624				4		33
155	Le Droit Park, block 3.	123				165		2		13
10	Le Droit Park, block 3.	8								1
43	L, between Twenty-first and Twenty-second streets, NW.	5								1
141	Market Space, Georgetown.			52				1		3
20	Madison street, between M and N streets, NW.		191					2		7
20	N street, between Thirtieth and Thirty-first streets, NW.			83				2		3

OF PERMIT SEWERS.

PERMIT SEWERS.

Estimated cost of work.	Amount of deposit.	Cost to District of Columbia.	Cost to property owner.	Total cost	Amount returned.	For whom done.	Overseer.	Date of completion.
\$400.00	\$200.00	\$200.00	\$200.00	\$400.00	.....	Edward Temple..	Condon....	June 11, 1890
140.00	70.00	65.57	65.57	131.14	\$4.43	Frank J. Tibbitts..	do	Oct. 26, 1889
166.00	83.00	83.00	83.00	166.00	.....	W. C. Goodwin...	Breen.....	Aug. 28, 1889
150.00	75.00	74.65	74.65	149.30	.35	Will A. Coulton..	Condon....	Oct. 22, 1889
30.00	15.00	14.24	14.24	28.48	.76	Oscar Nauck.....	G. C. Thomas	Jan. 28, 1890
186.00	93.00	63.35	63.34	126.69	29.66	Barr & Larnier...	Condon....	Feb. 12, 1890
68.00	34.00	28.12	28.12	56.24	5.88	I. W. Moore	do	Mar. 5, 1890
76.00	38.00	37.62	37.61	75.23	.39	Hannan & Co	Wilson.....	June 10, 1890
250.00	125.00	125.00	125.00	250.00	.....	Glenn Brown.....	G. C. Thomas	Sept. 9, 1889
250.00	125.00	114.63	114.63	229.26	10.37	T. B. Campbell ...	Condon....	Oct. 19, 1889
56.00	28.00	23.34	23.34	46.68	4.66	Swormstedt & Bradley.	G. C. Thomas	Dec. 16, 1889
174.00	87.00	86.97	86.98	173.95	.02	C. Early.....	Wilson.....	May 19, 1890
96.00	48.00	47.67	47.67	95.34	.33	W. J. Acker.....	G. C. Thomas	Sept. 11, 1889
418.76	209.38	180.11	180.11	360.22	29.27	E. J. Hannan.....	Condon....	Nov. 1, 1889
110.00	55.00	47.84	47.84	95.68	7.16	Compulsory.....	Breen.....	Oct. 2, 1889
72.00	36.00	31.75	31.74	63.49	4.26	A. B. Mullett.....	G. C. Thomas	Nov. 30, 1889
234.00	117.00	116.99	116.99	233.98	.01	Oliver Cox	Condon....	Aug. 9, 1889
3,612.00	1,806.00	737.56	737.56	1,475.12	15.49	Hannan & Co	Breen.....	Aug. 26, 1889
		485.86	485.86	971.72		Dulaney & Whiting.	Wilson ..	May 1, 1890
		567.08	567.09	1,134.17			do	
62.00	31.00	30.02	30.02	60.04	.98	Compulsory.....	Condon....	Nov. 20, 1889
114.00	57.00	56.64	56.63	113.27	.37	Jos. A. Herbert...	G. C. Thomas	Mar. 27, 1890
190.00	95.00	89.37	89.37	178.74	5.63	Thomas Yates	Condon....	Mar. 21, 1890
30.00	15.00	14.27	14.27	28.54	.73	Wm. Yeast & Bro.	do	Mar. 31, 1890
117.50	58.75	58.73	58.74	117.47	.01	E. McCarten	do	Apr. 2, 1890
210.00	108.00	107.93	107.93	215.86	.07	B. Kernan	G. C. Thomas	Oct. 26, 1889
80.00	40.00	39.80	39.80	79.60	.20	T. A. Buckingham	Condon....	Mar. 31, 1890
60.00	30.00	20.85	20.85	41.70	9.15	Richmond and Danville R. R. Co.	do	Feb. 27, 1890
660.00	325.00	114.96	114.96	229.92	30.87	P. C. Palmer.....	do	Feb. 1, 1890
550.00	275.00	273.14	273.14	546.28	1.86	Oliver Cox	do	Feb. 1, 1890
120.00	60.00	57.70	57.70	115.40	2.30	Christian Rappert	G. C. Thomas	Oct. 25, 1889
50.00	25.00	28.13	28.12	56.25	.....	J. T. Lenman	Condon....	Mar. 28, 1890
45.00	22.50	18.10	18.10	36.20	4.40	L. M. Taylor	Wilson.....	June 11, 1890
16.00	8.00	7.37	7.36	14.73	.64	R. Emmons	G. C. Thomas	Dec. 14, 1889
214.28	107.13	104.98	104.98	209.96	2.15	Compulsory.....	do	Jan. 4, 1890
593.04	593.04	1,186.08	1,186.08	.....	.....	W. Busey	do	Nov. 16, 1889
480.00	240.00	239.05	239.05	478.10	.95	Leon E. Dessez...	do	Aug. 26, 1889
16.00	8.00	7.68	7.69	15.37	.31	Compulsory.....	Wilson.....	Apr. 24, 1890
50.00	25.00	24.01	24.02	48.03	.98	W. J. Newton	Condon....	Oct. 13, 1889
176.00	88.00	87.91	87.92	175.83	.08	W. E. Brown	do	Apr. 24, 1890
280.00	140.00	132.91	132.91	265.82	7.09	N. T. Haller.....	Breen.....	July 20, 1889
150.00	75.00	74.94	74.94	149.88	.06	P. J. Dulaney	do	Sept. 4, 1889
						W. A. Kimmell	Condon....	Apr. 20, 1890
						C. W. Curtis.....	G. C. Thomas	Aug. 17, 1889

PERMIT SEWERS—

No. of order.	Location.	Pipe sewers laid (length in feet).					Con- crete. 2.50 by 3.75 feet.	Manholes built.	Basins built.	Branches used.
		6-inch.	8-inch.	12-inch.	15-inch.	18-inch.				
38	P street, between Twenty-first and Twenty-second streets, NW.			302				1		16
105	P street, between Eleventh and Twelfth streets, northwest.			97				2		2
45	Road, between Thirty-first and Valley streets, NW.			184				2		8
69	R street, between Eighteenth and Nineteenth streets, NW.			120				1		6
74	R street, between Marion and Sixth streets, NW.		91					2		5
89	R street, between Fifth street and New Jersey avenue, NW.			174				1		12
16	Wiltberger, between S and T, Sixth and Seventh streets, NW.		132					2		15
42	Wallach Place, Thirteenth and Fourteenth, T and U streets, NW.			148				1		5
100	Washington, between Dumbarton and Beall streets, NW.		34	124				1		8
67	Second street, between C and D streets, SW.			154				1		8
80	Third street, between I and K streets, SE.			200		60		3		12
133	Third street, between I and Virginia avenue, SE.			370				2		17
13	Fifth street, between H and I streets, NE.			81				1		5
128	Fifth street, between G and H streets, NE.			314				2		13
4	H street crossing Fifth street, NE.			132				2		7
144	Seventh street, between P and Q streets, NW.			89						4
60	Ninth street, between E and F streets, NE.			64						5
22	Tenth street, between E and G streets, SE.			42						2
73	Tenth street, between F street and Maryland avenue, NE.			54						3
84	Tenth street, between F street and Maryland avenue, NE.			43						2
100	Tenth street, between F street and Maryland avenue, NE.			17						1
44	Twelfth street, between F and G streets, NW.		70					2		5
77	Thirteenth street, between T and U streets, NW.		154					2		10
21	Nineteenth street, between S and Cedar streets, NW.			197				2		10
50	Twentieth street, between R and S streets, NW.			151						5
53	Twenty-second street, between N and O streets, NW.			96				1		3
26	Thirty-fourth street, between N and O streets, NW.			177				1		9
64	Thirty-fourth street, between M and N streets, NW.			90				1		3
29	Thirty-fifth street, between N and O streets, NW.			84				1		5
41	Thirty-fifth street, between N and O streets, NW.			33				1		3
177	Alley, square 4		150							7
7	Alley, square 28		55					1	1	5
120	Alley, square 51			110				1	1	14
126	Alley, square 51			265		1		3	2	14
52	Alley, square 76			69				1	1	
65	Alley, square 91			93				2		
142	Alley, square 117			38						4
152	Alley, square 132			55						5
70	Alley, square 133			95				1		4
116	Alley, square 150			142				1		17
8	Alley, square 157			147				1		13
66	Alley, square 157			158				2		10
40	Alley, square 159			116				3		7
109	Alley, square 166			340				4		29
118	Alley, square 167		11	204				2	2	5
172	Alley, square 176			14						1
27	Alley, square 184			111				2		7
107	Alley, square 192			423				4	1	27
50	Alley, square 193		79					2		5

Continued.

Estimated cost of work.	Amount of deposit.	Cost to District of Columbia.	Cost to property owner.	Total cost.	Amount returned.	For whom done.	Overseer.	Date of completion.
\$520.00	\$60.00	\$258.47	\$258.47	\$516.94	\$1.53	Wm. P. Lipacomb	G. C. Thomas	Sept. 28, 1889
166.00	83.00	82.68	82.68	165.36	.32	N. Carusi.....	do	Jan. 27, 1890
250.00	125.00	115.42	115.41	230.83	9.59	J. E. Gadsby	Breen.....	Oct. 10, 1889
170.00	85.00	83.54	83.54	167.08	1.46	T. F. Schneider ..	G. C. Thomas	Nov. 7, 1889
190.00	95.00	71.65	71.64	143.29	23.36	John W. Phillips..	do	Nov. 30, 1889
		93.59	93.59	187.18		Compulsory.....	do	Jan. 2, 1890
156.00	78.00	75.18	75.18	150.36	2.82	C. T. Umhau	Condon	Aug. 14, 1889
188.00	94.00	92.27	92.27	184.54	1.73	Glenn Brown.....	Breen.....	Oct. 4, 1889
270.00	135.00	110.17	110.18	220.35	24.82	L. E. Dessez	Wilson	May 15, 1890
216.00	108.00	93.90	93.89	187.79	14.11	C. F. Smithson ...	G. C. Thomas	Nov. 14, 1889
		234.45	234.45	468.90		Compulsory	do	Dec. 13, 1889
		250.79	250.79	501.58		do	Condon	June 3, 1890
106.00	53.00	52.83	52.82	105.65	.18	Joseph S. Boss ..	Breen.....	July 24, 1889
448.00	224.00	174.84	174.84	349.68	49.16	W. Danenhower..	Condon	Mar. 25, 1890
		127.29	127.29	254.58		Compulsory	Breen.....	July 12, 1889
120.00	60.00	59.90	59.90	119.80	.10	F. Murray.....	Condon	Apr. 30, 1890
100.80	50.40	34.15	34.15	68.30	16.25	R. C. Mangum.....	Breen.....	Oct. 29, 1889
60.00	30.00	29.42	29.42	58.84	.58	M. L. Strobel	Condon	Aug. 21, 1889
71.26	35.63	30.47	30.47	60.94	5.16	S. Carr	G. C. Thomas	Nov. 22, 1889
52.50	26.25	24.10	24.09	48.19	2.16	John Cooksey	Condon	Feb. 4, 1890
23.00	11.50	11.22	11.22	22.44	.28	J. W. Longley	do	Feb. 4, 1890
172.00	86.00	71.67	71.67	143.34	14.33	Emmons & King ..	G. C. Thomas	Sept. 16, 1889
192.00	96.00	81.85	81.85	163.70	14.15	T. E. Smithson ...	do	Nov. 28, 1889
288.00	144.00	143.57	143.57	287.14	.43	Tyler & Rutherford.	do	Aug. 29, 1889
198.50	99.25	99.02	99.02	198.04	.23	C. C. Halpine.....	Condon	Oct. 25, 1889
250.00	125.00	120.57	120.58	241.15	4.42	Mrs. A. Pfluger...	G. C. Thomas	Nov. 3, 1889
240.00	120.00	112.47	112.47	224.94	7.53	Ray & Craig	do	Aug. 21, 1889
110.00	55.00	55.00	55.00	110.00		L. T. Cropley	do	Oct. 26, 1889
140.00	70.00	69.85	69.86	139.71	.14	John Curtin.....	Breen.....	Aug. 31, 1889
68.00	34.00	31.14	31.14	62.28	2.86	Jeremiah Sullivan.	do	Aug. 31, 1889
		74.79	74.79	149.58		Compulsory	Condon	June 30, 1890
110.00	55.00	43.96	43.96	87.92	11.04	W. Tayloe Snyder	G. C. Thomas	July 9, 1889
		121.45	121.45	242.90		Compulsory	Wilson	Mar. 19, 1890
		346.01	346.01	692.02		do	do	Mar. 15, 1890
		61.10	61.10	122.20		do	G. C. Thomas	Nov. 5, 1889
170.00	85.00	76.68	76.67	153.35	8.33	T. F. Schneider ..	Condon	Oct. 29, 1889
72.00	36.00	25.47	25.47	50.94	10.53	C. T. S. Brent	Wilson	May 15, 1890
75.00	37.50	35.58	35.58	71.16	1.92	N. Crawley	do	May 20, 1890
174.00	87.00	65.44	65.45	130.89	21.55	H. Sharpless	G. C. Thomas	Nov. 18, 1889
240.00	120.00	87.32	87.32	174.64	32.68	J. H. Grant	Condon	Mar. 31, 1890
200.00	100.00	99.32	99.31	198.63	.69	P. E. Chapin	Breen.....	July 18, 1889
250.00	125.00	113.75	113.76	227.51	11.24	Geo. C. Bloomer ..	G. C. Thomas	Oct. 30, 1889
212.24	106.12	105.95	105.95	211.90	.17	Susan P. Okie	Breen.....	Oct. 17, 1889
		264.57	264.57	529.14		Compulsory	Wilson	Feb. 20, 1890
		172.48	172.48	344.96		do	D. Thomas ..	May 28, 1890
32.00	16.00	11.00	11.00	22.00	5.00	E. D. Corcoran ..	Wilson	June 5, 1890
190.00	95.00	71.54	71.54	143.08	23.46	W. H. Claggett ..	Breen.....	Sept. 24, 1889
		253.89	253.89	507.78		Compulsory	Wilson	Feb. 7, 1890
180.00	65.00	61.15	61.15	122.30	3.85	G. E. Emmons, agt.	Breen.....	Oct. 19, 1889

Work done by day labor, main and pipe sewers—Continued.

Location.	Pipe sewers laid (length in feet).							Manholes.	Branches.	Basins.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.
	6-inch.	8-inch.	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.							
Alley square—Continued.			168					3	24	1	\$175.10	\$140.40	\$3.88	\$319.38
620											19.31	10.93	19.17	49.41
624			6					1		1	21.45	1.98	23.35	46.78
630			9					2			11.75	3.24	16.21	31.20
676			6							1	46.87	20.18	26.64	93.69
759			9							2	33.11	36.97	5.30	75.38
859			3							1	37.93	29.51	7.48	74.92
950			36								6.75			6.75
Property yard, reservation 17*														
Total	132	220	4,629	426	359	27	1,032	51	195	48	8,638.30	3,855.06	2,344.13	15,037.49

* Moving, unloading, and storing pipe.

TABULAR STATEMENT OF SUBURBAN SEWERS LAID UNDER CONTRACT.
Contract work—Appropriation for construction of suburban sewers.

No.	Contractor.	Location.	Size of sewer.	Length.	Price per foot.		Excavation.		Masonry.			Rock excavation.	Cost of work.	Extra work.	Amount paid contractor.	Cost of material.	Cost of inspection.	Total cost.
							Excess.	Deficit.	Excess.	Deficit.	Concrete.							
1195	J. J. Cudmore ..	California, Connecticut and Wyoming avenues, NW.	12-inch.....	<i>Feet.</i> 1,789.0	\$0.79	\$26.12	.....	.....	.....	\$3.51	.....	.....	\$1,435.92	.....	\$1,435.92	\$436.70	\$73.56	\$1,946.18
1195	.....do.....	Trumbull and Sixth streets, NW.	12-inch.....	935.0	.79	.....	\$44.37	.....	.....	14.04	.....	.....	680.24	\$4.74	684.98	206.50	35.09	926.57
1195	.....do.....	Wilson street, east of Linden street, NW.	12-inch.....	251.0	.79	.....	6.32	.....	.....	7.18	.....	.....	184.79	.....	184.79	56.18	9.47	250.44
		Total .....	.....	2,975.0	.....	26.12	50.69	.....	.....	24.73	.....	.....	2,300.95	4.74	2,305.69	699.38	118.12	3,123.19
1170	.....do.....	Linden between Maryland and Wilson streets, NW.	18-inch.....	907.5	1.07	283.65	.....	26.68	.....	.....	.....	.....	1,281.35	8.29	1,289.64	412.55	66.08	1,768.27
1183	W. H. Mohler...	Eighth street extended, Grant avenue to Irving street.	24-inch.....	700.0	1.35	.....	21.15	.....	.....	4.70	.....	.....	919.15	.....	919.15	711.34	47.10	1,677.59
1202	P. H. Sugrue....	Shannon Place extended, Anacostia, Nichols avenue to Washington and Rock Creek Valley from P. street to Lyon's Mill.	Brick and concrete, 2.50 by 3.75 feet.	556.0	3.94	.....	77.73	.....	.....	20.50	\$704.00	\$43.12	2,839.44	.....	2,839.44	60.07	145.47	3,044.98
1197	Andrew Gleeson.	Brick 2.75 by 4.125 feet.	.....	1,223.6	4.60	.....	.....	.....	.....	.....	.....	.....	5,628.56	1,570.57	7,199.13	.....	368.83	7,567.96
1171	James McCandlish.	Superior street, Champlain to Meridian avenues.	Brick and concrete, 3 by 4.5 feet.	1,351.0	4.45	.....	100.19	.....	.....	25.96	.....	.....	5,825.80	227.38	6,053.18	248.93	310.11	6,612.22
1171	.....do.....	First street NW., S to U streets.	Concrete, 7.64 feet diameter.	581.1	9.90	.....	1.14	.....	.....	3.09	2.73	4.17	5,761.73	5.92	5,767.65	1.84	295.48	6,064.97
		Total .....	.....	.....	.....	.....	161.33	3.09	25.96	2.73	4.17	.....	11,587.53	233.30	11,820.83	250.77	605.59	12,677.19

Contract work—Appropriation for construction of suburban sewers—Continued.

No	Contractor.	Location.	Size of sewer.	Length.	Price per foot.	Excavation.		Masonry.			Timber left in trench.	Rock excavation.	Cost of work.	Extra work.	Amount paid contractor.	Cost of material.	Cost of inspection.	Total cost.
				<i>Feet.</i>		Excess.	Deficit.	Excess.	Deficit.	Concrete.								
1182	M. F. Tally	Champlain avenue	Brick and concrete, 3.25 by 4.875 feet	559.0	\$4.90		\$7.79		\$11.48				\$4,189.83	\$2,017.88	\$6,207.71	\$194.27	\$318.02	\$6,720.00
1182	do	Adams and Jefferson streets, Anacostia.	Brick and concrete, 3.25 by 4.875 feet.	578.4	4.90		86.55		7.80				2,739.75	106.12	2,845.87	127.06	145.79	3,118.72
		Total		1,437.4			94.34		19.34				6,929.58	2,124.00	9,053.58	321.33	463.81	9,838.72

Work done by day labor—Appropriation for construction of suburban sewers.

Location.	Pipe sewers laid (length in feet).				Manholes.	Basins.	Branches.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.
	12-inch.	15-inch.	18-inch.	21-inch.	24-inch.						
Champlain avenue ¹								\$477.15			\$477.15
Do ²						1		20.88		\$14.74	35.63
Connecticut and Kalorama avenues ³								55.62			55.62
Grant avenue and Eighth street ⁴								36.49			36.49
Kenesaw avenue, between Fourteenth and Sixteenth streets	351					2	12	263.41	\$27.20	115.46	406.07
Sherman avenue ⁵		9	39					49.76	14.15	13.18	77.09
Do ⁶				18				173.48	19.03	40.21	232.72
Do ⁷								15.72			15.72
Seventh street and Grant avenue, and Eighth street and Grant avenue		9		33		4		430.16	80.21	63.30	573.67
Eighteenth street extended, between Florida and Wyoming avenues				699		28		1,290.63	204.12	769.51	2,264.26
Nineteenth street extended, between Florida and California avenues		323	433			9		1,306.33	169.30	376.13	1,851.76
Adams street, Anacostia ⁸								46.37			46.37
Navy street, Anacostia ⁹						1		18.31	2.50	3.09	23.89
Shannon Place and Nichols avenue, Anacostia ¹⁰								79.24	41.43	33.97	154.64
Total	351	341	472	699	51	6	49	4,263.55	557.94	1,429.58	6,251.07

¹ Repairing old dam.² Wooden basin at sand crib.³ Repairing 24-inch sewer.⁴ Repairing bottom of sewer.⁵ Repairing old dam, etc.⁶ Constructing inlets to sewer.⁷ Cleaning mouth of sewer.⁸ Constructing inlet to sewer.⁹ Constructing wooden basin.¹⁰ Connecting sewer with culvert.

TABULAR STATEMENT OF REPLACING OBSTRUCTED SEWERS, LAID UNDER CONTRACT.

Contract work—Appropriation for replacing obstructed sewers.

No.	Contractor.	Location.	Size of sewer.	Length.	Price per foot.	Excavation excess.	Masonry.		Lumber left in trench.	Cost of work.	Extra work.	Amount paid contractor.	Cost of material.	Cost of inspection.	Total cost.
							Excess.	Concrete.							
1183	W. H. Mohler.....	T street, NW., between Twelfth and Thirteenth streets.	Inches. 24	Feet. 515.3	\$1.35	\$55.67	\$17.76	\$9.00	\$34.26	\$202.12	\$2.33	\$394.35	\$538.83	\$90.00	\$1,403.18

* \$10.22 deducted for two manhole frames, covers, and irons less than specification requirements.

Work done of way labor.—Appropriation for replacing constructed sewers.

Location.	Pipe sewers relaid (length in feet.)				Manholes.	Branches.	Cost of labor.	Cost of material.	Value of material on hand.	Total cost.	Total length of pipe relaid.
	12-inch.	15-inch.	18-inch.	24-inch.							
Pennsylvania avenue, between Third and Four-and-a-half streets, NW.				296	2	12	\$498.51	\$16.13	\$349.93	\$864.57	296
A street, between Third and Fourth streets, NE.							10.37			10.37	
B street, between Third and Fourth streets, NE.	167						139.22	2.14	35.80	177.16	167
B street, crossing First street, NE.		70			1		77.92	12.09	39.30	129.91	70
D street, between Eighth and Ninth streets, NW.	223					6	253.83	29.60	75.59	359.02	223
East Capitol, between Tenth and Eleventh streets (N. side)	90					3	43.00		36.94	79.94	90
G street, between Eighth and Ninth streets, NW.							12.15			12.15	
H street, between Third and Fourth streets, NW.		126			3		215.01		24.55	239.56	126
I street, between North Capitol and First streets, NE.			579		1	27	634.11	169.64	303.30	1,107.05	579
K street, between Fifteenth and Sixteenth streets, and Sixteenth street between K and L streets, NW.							765.98		341.57	1,107.55	551
O street, between Fifteenth and Sixteenth streets, NW.		551			1	19	28.71			28.71	
T street, between Fourteenth and Fifteenth streets, NW.			340				813.36	33.35	85.47	932.18	340
First street, between B and C streets, NE.		612			3	23	574.68	142.17	224.65	941.50	612
Fourth street, between D and E streets, SE.	177						97.20		15.17	112.37	177
Four-and-a-half street, between H and I streets, SW.	150				1	9	184.05	28.48	83.04	295.57	150
Sixth street, between E and F streets, SW.	249				1	10	237.82	14.45	106.64	358.91	249
Seventh street, between B street, NW and B street, SW.			1,460		2		1,289.26	9.34	443.60	1,742.20	1,460
Seventh street, from Florida avenue northward							17.06			17.06	
Eleventh street, between Virginia and Maryland avenues, SW.	336				9		153.13	33.48	80.88	267.49	336
Eleventh street, between South Carolina avenue and D street, SE.		407			3	13	320.97	30.56	211.88	563.41	407
Fifteenth street, between K and L streets, NW.	27						50.99		10.47	61.46	27
Sixteenth street, between L and M streets, NW.		648			1	34	1,870.02	228.52	339.91	2,438.45	648
Alley, square 127	87						71.45		23.22	94.67	87
Alley, square 396		63					100.86		30.75	131.61	63
Alley, square 623	218				1	18	501.32	55.60	93.08	650.00	218
Total	1,613	2,477	2,379	296	17	186	8,900.98	790.15	2,955.74	12,742.87	6,705

CHARACTER AND EXTENT OF STREET PAVEMENTS.

Character and extent of street pavements, July 1, 1890.

WASHINGTON.

[Streets marked thus * have been paved since July 1, 1878.]

Street.	From—	To—	Carriage way.						Remarks.	
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.		Gravel.	Unimproved.
North Capitol.	B street north.	C street north	Feet.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Gravel from K to Boundary.
Do.	C street north.	Boundary.	50	2,790					4,542	
South Capitol.	B street north.	M street south.	50	14,395					16,058	
Do.	M street south.	N street south.	50						26,284	
Do.	N street south.	River.	50						13,259	From M st. south to N st. 1,511 yards cobble bet. R. R. tracks.
First street east.	B street north.	B street south.	50	8,657			3,243			
Do.	do.	C street north.	35	*1,986			1,511			O. c. walk, curb, and gutter, G to K street.
Do.	C street north.	K street north.	85					9,245	2,217	
Do.	K street north.	Boundary.	35						9,431	From B st. south to C st. O. c. walk, curb, and gutter, M to N. Cobble bet. R. R. tracks. Concrete from H to Deftrees. Cobble bet. R. R. tracks.
Do.	B street south.	C street south.	32		*2,151				4,379	
Do.	C street south.	Canal.	35	1,260					3,560	
Do.	Canal.	River.	35						6,222	
First street west.	Pennsylvania avenue.	Indiana avenue.	56 }		*8,332		4,055			Concrete from H to Deftrees. Cobble bet. R. R. tracks.
Do.	Indiana avenue.	F street north.	40 }		*1,427					
Do.	G street north.	H street north.	32	*700	*535					
Do.	H street north.	I street north.	32	1,191						
Do.	I street north.	K street north.	32						11,022	Cobble bet. R. R. tracks.
Do.	K street north.	Boundary street.	32							
Do.	Pennsylvania avenue.	Maryland avenue.	53	*4,861			1,133			
Do.	Maryland avenue.	N street south.	35		17,929		2,314			
Do.	N street south.	River.	34						13,160	O. c. walk, curb, and gutter, G to L.
Do.	N street south.	Maryland avenue.	35							
second street east.	Pennsylvania avenue.	H street north.	32	*6,597					14,222	
Do.	Maryland avenue.	Boundary street.	32						3,416	
Do.	H street north.	D street south.	32 }	*4,906						O. c. walk, curb, and gutter, G to L.
Do.	Pennsylvania avenue.	Canal.	35 }						1,244	
Do.	D street south.	River.	35 }						5,461	
Do.	Canal.		32						4,029	

O. c. walk, curb, and gutter,
G to L.

[illegible]

Character and extent of street pavements, July 1, 1890—Continued.

WASHINGTON

[Streets marked thus * have been paved since July 1, 1878.]

Street.	From—	To—	Carriage way.						Remarks.	
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue-rock.	Macadam.		Gravel.	Unimproved.
			<i>Feet.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>
Sixth street west.....	D street south.....	Water street.....	40	.....	11,780	.....	.....	.....	.....	.....
Seventh street east.....	East Capitol.....	Massachusetts avenue.....	32	*3,340	.....	.....	.....	.....	.....	.....
Do.....	Massachusetts avenue.....	Boundary.....	32	3,315	.....	.....	.....	.....	11,215	.....
Do.....	East Capitol.....	Pennsylvania avenue.....	32	*7,223	.....	.....	.....	.....	.....	.....
Do.....	Pennsylvania avenue.....	D street south.....	32	.....	.....	.....	.....	.....	.....	.....
Do.....	D street south.....	M street south.....	32	8,394	.....	.....	.....	.....	890	.....
Seventh street west (west side).....	Market Space.....	D street north.....	18	.....	*506	.....	.....	.....	.....	.....
Seventh street west.....	Pennsylvania avenue.....	.....do.....	51	1,579	.....	.....	755	.....	.....	.....
Do.....	D street north.....	Q street north.....	51	.....	20,023	.....	9,666	.....	.....	.....
Do.....	Q street north.....	Boundary.....	51	.....	*7,746	.....	*3,164	.....	.....	.....
Do.....	Pennsylvania avenue.....	Water street.....	51	.....	24,167	.....	8,711	.....	.....	.....
Eighth street east.....	East Capitol.....	I street north.....	40	.....	.....	.....	.....	.....	13,523	.....
Do.....	D street north.....	Boundary.....	40	2,994	.....	.....	.....	.....	.....	.....
Do.....	East Capitol.....	Pennsylvania avenue.....	40	.....	.....	.....	.....	.....	.....	.....
Do.....	Pennsylvania avenue.....	K street south.....	55	*10,072	.....	.....	.....	.....	.....	.....
Do.....	K street south.....	M street south.....	55	*3,265	.....	.....	4,277	.....	.....	.....
Eighth street west.....	C street north.....	E street north.....	51	.....	*3,652	.....	.....	.....	5,444	.....
Do.....	E street north.....	F street north.....	51	.....	.....	.....	.....	.....	5,892	.....
Do.....	G street north.....	Mount Vernon Place.....	30	1,963	.....	.....	.....	.....	.....	.....
Do.....	Mount Vernon Place.....	L street north.....	30	*4,883	.....	.....	.....	.....	.....	.....
Do.....	L street north.....	N street north.....	30	3,610	.....	.....	.....	.....	.....	.....
Do.....	N street north.....	R street north.....	30	*6,493	.....	.....	.....	.....	.....	.....
Do.....	R street north.....	Boundary.....	30	*6,687	.....	.....	.....	.....	.....	.....
Do.....	B street south.....	C street south.....	32	.....	.....	.....	.....	.....	.....	.....
Do.....	C street south.....	Water street.....	32	.....	.....	.....	*1,244	.....	8,048	484
Ninth street east.....	East Capitol.....	Boundary.....	32	.....	.....	.....	.....	.....	7,502	9,280
Do.....	.....do.....	Pennsylvania avenue.....	32	.....	.....	.....	.....	.....	6,179	.....
Do.....	.....do.....	.....do.....	.....	.....	.....	.....	.....	.....	.....	.....

Unimproved from Maryland to Massachusetts avenue.
O. c. walk, curb, and gutter.
Cobble bet R. R. tracks.
Do.
3,400 yards bet R. R. tracks.
Cobble bet R. R. tracks.
O. c. walk, curb, and gutter.
Cobble bet R. R. tracks.
Gravel from Maryland avenue to K street; o. c. walk, curb, and gutter, East Capitol to C street.
O. c. walk, curb, and gutter.

Do	Pennsylvania avenue	M street south	32	22,360	945	2,900	Cobble bet. R. R. tracks.
Ninth street west	do	R street north	31	22,070	10,233	Do.	Do.
Do	do	P street north	31	-6,147	4,800	Do.	Do.
Ninth street west (west side)	do	Boundary	51				
Ninth street west (east side)	do	do	51	-5,130			Asphalt surface on cobble foundation from B to C.
Ninth street west	do	Water street	32	1,454			Gravel from East Capitol to I street.
Tenth street east	East Capitol	Boundary	32			13,830	O. c. walk, curb, and gutter.
Do	do	Pennsylvania avenue	32			15,644	Trap rock.
Do	do	M street south	32				
Tenth street west	Pennsylvania avenue	B street north	51	3,103			
Do	do	E street north	32	-1,544			
Do	E street north	F street north	32	-1,372			
Do	F street north	G street north	32	-856			
Do	G street north	M street north	32	8,296			3,469 square yards paved since 1878.
Do	do	R street north	32	-7,876			
Do	R street north	Boundary	32	-1,092			Gravel from R to S street.
Do	D street north	Water street	32		5,000		
Do	B street south	Maryland avenue	32	-2,411			
Eleventh street east	East Capitol	Boundary	32			13,063	
Do	Massachusetts avenue	Pennsylvania avenue	50				
Do	Pennsylvania avenue	River	56	30,148	879		
Do	do	B street north	55		3,145		
Do	do	E street north	55	-2,500			
Do	F street north	G street north	55	-1,734	718		
Do	G street north	H street north	55	-1,214	510		Do.
Do	I street north	K street north	55	4,241	1,448		Do.
Do	J street north	L street north	35	875	566		Do.
Do	K street north	O street north	35		3,668		Do.
Do	O street north	R street north	35	-4,326	4,375		2,115 yards cobble bet. R. R. tracks.
Do	do	Boundary					Cobble bet. R. R. tracks.
Do	R street north	Water	35		4,355	6,908	
Do	B street south	Boundary	32	10,511			
Twelfth street east	Lincoln Square	River	32		3,841		
Do	do	do	32			17,956	
Twelfth street west	Pennsylvania avenue	Ohio avenue	40	-1,292			
Do	do	E street north	38				
Do	F street north	F street north	38	-1,627			
Do	G street north	N street north	32	13,039			
Do	N street north	Rhode Island avenue	32	4,577			
Do	Rhode Island avenue	Boundary	32	7,681			4,266
Do	do	Water street	32				
Do	B street north	Boundary	40	17,206			
Do	do	River	32				14,898
Thirteenth street east	do	E street north	32	-685			14,820
Do	Pennsylvania avenue	F street north	40	-1,741			
Thirteenth street west	E street north	K street north	40	7,772			
Do	F street north	Pennsylvania avenue	40	5,582			1,760 square yards paved since 1878.
Do	B street north		40				

Character and extent of street pavements, July 1, 1890—Continued.

WASHINGTON.

[Streets marked thus * have been paved since July 1, 1878.]

Street.	From—	To—	Carriage way.						Remarks.
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.	
			<i>Feet.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Unimproved.</i>
Thirteenth street west	K street north	Circle	32	8,090					
Do	Circle	Boundary	32	*6,398					
Do	B street south	Maryland avenue	40	5,700					
Do	Maryland avenue	Water street	40						
Thirteen-and-a-half street west.	Pennsylvania avenue	B street north	35						
Do							5,095		1,636
Fourteenth street east	B street south	Maryland avenue	32				4,291		
Do	East Capitol	Boundary	35						
Do		River	32		7,841				
Fourteenth street west	B street north	F street south	40		*2,618				
Do		F street north	70	*9,518					
Do									
Do	F street north	Thomas Circle	70	*16,655					
Do	Thomas Circle	Boundary	70	32,782			4,004		
Do	B street south	Water street	40				8,024		
fifteenth street east	East Capitol	Boundary	32				6,764		
Do		River	32						
fifteenth street west.	Pennsylvania avenue	B street north	43	*7,012					
Do									
Do	New York avenue	H street north	70	4,478			1,322		
Do	H street north	K street north	50	7,005					
Do	K street north	Rhode Island avenue	40						
Do	Rhode Island avenue	S street north	32	*6,920					
Do	S street north	Boundary	32	7,516					
Do	S street north	H street north	33	*4,059					
fifteen-and-a-half street west.	Pennsylvania avenue		40	1,997				2,806	
Sixteenth street east.	East Capitol	C street north	32						
Do		Kentucky avenue	32						
Sixteenth street west	H street north	Boundary street	50	*36,656					5,973
Sixteen-and-a-half street west.	Pennsylvania avenue	H street north	40	2,196					8,782
Seventeenth street east.	East Capitol	C street north	32						4,196

5,942 square yards paved since 1878.
Asphalt to T street.275 square yards cobble between railroad tracks.
Cobble between K. R. tracks.
Do.
Do.

Character and extent of street pavements, July 1, 1890—Continued.

WASHINGTON.

[Streets marked thus * have been paved since July 1, 1878.]

Street.	From—	To—	Carriageway.						Remarks.
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.	
			Feet.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Unimproved.
Twenty-third street west.	Pennsylvania avenue.	M street north.	32	2,387					
Do.	M street north.	Rock Creek.	32						3,699
Twenty-fourth street east.	East Capitol street.	C street north.	32						4,196
Do.	do.	B street south.	32						2,560
Twenty-fourth street west.	E street north.	G street north.	32						2,069
Do.	M street north.	Pennsylvania avenue.	32						
Do.	Pennsylvania avenue.	M street north.	32				5,192		
Do.	M street north.	Rock Creek.	32				2,540		
Twenty-fifth street west.	Virginia avenue.	River.	32						1,200
Do.	Pennsylvania avenue.	Virginia avenue.	32				945	3,788	5,785
Do.	do.	Rock Creek.	30	1,693					
Twenty-sixth street west.	G street north.	D street north.	32						3,747
Do.	do.	K street north.	32				5,042	3,378	
Do.	K street north.	Pennsylvania avenue.	32	*1,680					
Do.	Pennsylvania avenue.	M street north.	32	919			505		
Twenty-seventh street west.	E street north.	L street north.	32						8,651
Do.	First street east.	Eleventh street east.	50	*17,915			6,044		
East Capitol street.	Eleventh street east.	Eastern Branch.	50						25,822
Do.	First street east.	Second street east.	35	*2,788					
A street north.	Second street east.	Fourth street east.	35	*2,972					
Do.	Fourth street east.	Eastern Branch.	35	6,506					17,111
Do.	First street east.	Third street east.	35	*3,985					
A street south.	Third street east.	Ninth street east.	35	*5,708				3,093	
Do.	Massachusetts avenue.	Eastern Branch.	35						14,800
Do.	do.	do.	32					4,398	
South side Lincoln Square.	Delaware avenue.	Maryland avenue.	46	5,690			1,819		
B street north.	Maryland avenue.	Eleventh street east.	35	*7,059					2,460
Do.	Eleventh street east.	Eastern Branch.	35					6,422	15,578
Do.	New Jersey avenue.	Pennsylvania avenue.	45	4,282			2,205		
Do.	Pennsylvania avenue.	Fifth street east.	35	*3,809					
B street south.	Fifth street east.	Seventh street east.	35	*3,194					
Do.	Seventh street east.	Twelfth street east.	35						4,946
Do.	Twelfth street east.	Eastern Branch.	32						18,123
Do.	Twelfth street east.	Eastern Branch.	32						

O. c. walk, curb, and gutter.

[illegible]

G street south	South Capitol	Four-and-a-half street west.	35									988
Do	Four-and-a-half street west.	Seventh street west	35	*4,206								
Do	Seventh street west.	Water street.	35									
G street north	North Capitol.	Fifteenth street east	35	2,308							2,238	
Do	do	First street west.	35	*3,802							3,210	
Do	First street west.	Seventh street west	35	8,683								
Do	Seventh street west.	Fifteenth street west.	40	15,097								
Do	Seventeenth street west.	Twenty-second street west.	36	10,275								
Do	Twenty-second street west.	Twenty-seventh street west.	36									
G street south.	Third street east.	Seventeenth street east.	35									10,019
Do	South Capitol.	Four-and-a-half street west.	35	2,475								
Do	Four-and-a-half street west.	Eleventh street west	35	*10,982								
H street north.	North Capitol.	First street east	56	*4,604								
Do	First street east	Fifteenth street east.	56	28,081								
Do	North Capitol.	First street west.	56									
Do	First street west.	Fourth street west.	56									
Do	Third street west.	Seventh street west.	56	*7,105								
Do	Seventh street west.	Thirteenth street west.	35	9,007								
Do	Thirteenth street west.	Fourteenth street west.	40	2,144								
Do	Fourteenth street west.	Fifteenth street west.	56	*1,948								
Do	Fifteenth street west.	Fifteen-and-a-half street west.	56	1,729								
Do	Vermont avenue.	Nineteenth street west	56	*8,328								
Do	Pennsylvania avenue	Twenty-second street west.	32	6,493								
Do	Twenty-second street west.	Twenty-seventh street west.	32									
H street south.	South Capitol.	Water street.	35	*12,083								
I street north.	North Capitol.	Boundary	35	3,297								
I street south	South Capitol.	Georgia avenue	35									
I street north.	North Capitol	New Jersey avenue.	35	4,557								
Do	do	Massachusetts avenue.	35	*5,804								
Do	Fifth street west.	Eighth street west	32	*4,210								
Do	do	Ninth street west.	32	*755								
Do	do	Tenth street west.	32	*2,090								
Do	do	Eleventh street west.	32	*813								
Do	do	Fifteenth street west.	40	8,332								
Do	do	Vermont avenue.	56									
Do	do	Seventeenth street west.	40	8,332								
Do	do	Eighteenth street west.	40	*2,672								
Do	do	do	40									

Gravel from 6th to 13th st.

Cobble bet. R. R. tracks.

O. c. walk, curb, and gutter, from 11th to 14th street.
O. c. walk, curb, and gutter, from 2d to 4d street.Cobble bet. R. R. tracks.
Do.

Do.

Do,
15th to 17th street, cobble bet. R. R. tracks.Gravel from North Capitol to 1st street east and from 7th to Boundary street.
O. c. walk, curb, and gutter, 3d to 5th and 7th to 11th sts.

Character and extent of street pavements, July 1, 1890—Continued.

WASHINGTON.

(Streets marked thus * have been paved since July 1, 1878.)

Street.	From—	To—	Carriage way.						Remarks.	
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.		Gravel.	Unimproved.
I street north.....	Eighteenth street west.	Nineteenth street west.	Feet.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	
Do.....	Nineteenth street west.	Twentieth street west.	40	5,536						
Do.....	Twentieth street west.	Pennsylvania avenue.	40							
Do.....	Pennsylvania avenue.	Twenty-sixth street west.	40							
I street south.....	South Capitol.....	Water street.....	35							O. c. walk, curb, and gutter, 4½ to 7th street.
K street north.....	North Capitol.....	Seventh street east.	50	4,498						
Do.....	Seventh street east.	Boundary street.....	50							
Do.....	North Capitol.....	Third street west.	50				8,083			8,378
Do.....	Third street west.	Seventh street west.	50	8,384						
Do.....	Seventh street west.	Ninth street west { N. S.	30	5,418						
Do.....	Ninth street west.	Eighteenth street west { S. S.	53½							
Do.....	Eighteenth street west.	Pennsylvania avenue.	50	27,551						
Do.....	Twenty-fourth street west.	Twenty-eighth street west.	50	12,290	12,571					
K street south.....	South Capitol street.....	Canal.....	35						775	4,163
Do.....	Canal.....	Seventh street east.	60							7,430
Do.....	Seventh street east.	Eastern Branch.....	35							14,855
Do.....	South Capitol.....	Water street.....	35					11,108		2,592
street north.....	North Capitol.....	Boundary street.....	32							15,154
Do.....	do.....	New Jersey avenue.....	32							4,700
Do.....	New Jersey avenue.	Fourth street west.	32	2,072						
Do.....	Fourth street west.	Fifth street west.	32		2,665					
Do.....	Fifth street west.	Sixth street west.	32	1,425						
Do.....	Sixth street west.	Seventh street west.	32	2,645						
Do.....	Seventh street west.	Eleventh street west.	32	4,041						
Do.....	Eleventh street west.	Twentieth street west.	32	16,353						
Do.....	Twentieth street west.	Twenty-sixth street west.	32	8,624						
Do.....	Twenty-sixth street.	Rock Creek.....	32	1,170						

Character and extent of street pavements, July 1, 1889—Continued.

WASHINGTON.

[Streets marked thus * have been paved since July 1, 1873.]

Street.	From—	To—	Carriage way.						Remarks.	
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.		Gravel.	Unimproved.
			Feet.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	
R street north.....	Ninth street west.....	Fourteenth street west.....	32	7,744						
Do.....	Fourteenth street west.....	Sixteenth street west.....	32	4,502						
Do.....	Sixteenth street west.....	Boundary.....	32	*1,411						
R street south.....	South Capitol.....	Arsenal.....	30							
S street north.....	New Jersey avenue.....	Vermont avenue.....	32	5,038						
Do.....	Vermont avenue.....	Sixteenth street west.....	32	8,811						
Do.....	Sixteenth street west.....	Boundary.....	32	3,758						
S street south.....	South Capitol.....	Arsenal.....	30							
T street north.....	Boundary.....	Ninth street west.....	32							
Do.....	Ninth street west.....	Boundary.....	32					19,600	2,067	
T street south.....	Half street west.....	Arsenal.....	30							
U street north.....	Vermont avenue.....	Boundary.....	32							
U street south.....	Arsenal.....	Eastern Branch.....	30							
V street north.....	Vermont avenue.....	Boundary.....	32							
V street south.....	Arsenal.....	Eastern Branch.....	30							
W street north.....	Boundary.....	Boundary.....	32							
Boundary.....	Massachusetts avenue.....	Ninth street west.....	46					48,300	3,000	
Do.....	Seventh street west.....	do.....	45		2,304					
Do.....	Sixth street west.....	Seventh street west.....	46					3,019		
Connecticut avenue.....	do.....	Fifteenth street east.....	46	6,208					5,062	47,040
Do.....	H street north.....	I street north.....	50	2,210						
Do.....	K street.....	Du Pont Circle.....	50	10,246			5,553			
Do.....	Du Pont circle.....	Boundary.....	50	*13,725						
Delaware avenue.....	B street north.....	C street north.....	50		*2,056					
Do.....	C street north.....	Boundary.....	50							
Do.....	B street south.....	P street south.....	50							
Do.....	Nineteenth street east.....	Eastern Branch.....	50							
Georgia avenue.....	First street west.....	Third street west.....	120	7,690						
Indiana avenue.....	Lincoln Square.....	Eastern Branch.....	50							
Kentucky avenue.....	Sixth street west.....	Seventh street west.....	60		*3,345					
Louisiana avenue.....	Pennsylvania avenue.....	Ninth street west.....	50		*1,137					
Do.....	Ninth street west.....	Tenth street west.....	78½		4,765					

O. c. walk, curb, and gutter,
from 17th to 19th street.Gravel from Massachusetts
avenue to R street.

Gravel from 6th to 8th st.

Cobble bet. R. R. tracks
Includes Du Pont Circle

Gravel from C to E street.

	Iowa Circle.	Boundary	50	\$6,153	1,711	3,576	6,424	Asphalt pavement to R st. Cobble bet. R. R. tracks, 383 sq. yards of asphalt blocks. Asphalt blocks.
Do.	Third street west.	Sixth street west.	60	\$4,766				
Intersection of Louisiana streets.	Tenth street west.	Twelfth street west.	50	\$3,214				
Intersection of Louisiana and Ohio avenues.	Seventh street west.	Ninth street west.	50	3,899	835			Cobble bet. R. R. tracks.
Mount Vernon Place.	Intersection	Thirteenth and M sts.	50	\$6,000	718			Do.
Louisa Circle.	do	Thirteenth and P streets	36	5,594				
Scott Square.	do	Fifteenth and N streets	65	12,560				
W. Font Circle.	do	Nineteenth and P streets	45	5,240	1,228			Do.
Washington Circle.	do	Twenty-third and K sts.	56	6,083	1,100			Do.
Opera Square.	do	Ninth and G streets		600				
Canal street.	B street south.	E street		5,186				
California street.	First street northeast.	Second street northeast.	30			7,773	5,814	2 roadways, 40 feet each.
Callan street.	Sixth street northeast.	Seventh street northeast.	30				2,143	
Carroll street.	First street southeast.	Second street southeast.	30			2,030	1,367	
Caroline street.	Fifteenth street north-west.	Sixteenth street north-west.	24			1,384		
Cedar street.	Nineteenth street north-west.	Nineteenth street north-west.	30				1,570	
Chicago street.	First street northeast.	Second street northeast.	32				2,285	
Columbia street.	O street northwest.	Q street northwest.	30	2,836				
Coxcoran street.	Thirteenth street north-west.	Fourteenth street north-west.	30	2,007				
Do.	Fourteenth street north-west.	New Hampshire avenue.	24	6,980				
Cleveland avenue.	W street.	Boundary						
Delces street.	First street northwest.	North Capitol street.	23	\$1,297				
De Sales street.	Seventeenth street northwest.	Connecticut avenue.	40	\$1,967				
Eldridge street.	Twentieth street north-west.	Twenty-first street north-west.	20	2,463			1,033	
Franklin street.	New Jersey avenue.	Fifth street west.	30			1,697		
Grant Place.	Ninth street west.	Tenth street west.	30	1,602				
Highland Terrace.	Fourteenth street west.	Fifteenth street west.	24	1,435				
Hillyer Place.	Twentieth street west.	Twenty-first street west.	21-5	1,248				
Ivy Place.	South Capitol street.	New Jersey avenue.	27	\$1,562			2,131	
Jackson street.	North Capitol street.	First street east.	35		1,738			
James street.	Twelfth street northeast.	Thirteenth street east.	20				1,151	
Jefferson Place.	Connecticut avenue.	Nineteenth street west.	20	1,383				
Johnson Place.	R street northwest.	S street northwest.	27	1,446				
Kingman Court.	P street northwest.	Q street northwest.	30	1,609				
Kirby street.	New York avenue.	N street northwest.	30				1,760	
Lawrence street.	Eighteenth street north-west.	Nineteenth street north-west.	32				1,570	
Madison street.	M street north west.	N street north west.	30	1,538				
Marion street.	P street northwest.	R street northwest.	26	2,801				

Character and extent of street pavements, July 1, 1890—Continued.

WASHINGTON.

[Streets marked thus * have been paved since July 1, 1878.]

Street.	From—	To—	Carriage way.						Remarks.	
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.		Gravel.	Unimproved.
Monroe street	Sixteenth street north-west.	Seventeenth street north-west.	Feet. 24		Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.
McLean avenue	Third street	Four-and-a-half street south-west.		*2, 127						1, 387
Myrtle street	North Capitol street	First street northeast.	20	1, 426						
Oregon street	Eighteenth street north-west.	Nineteenth street north-west.	30							2, 433
Park street	Eleventh street north-east.	Twelfth street northeast	30						1, 110	
Pierce place	Fifteenth street north-west.	Sixteenth street north-west.	30						1, 715	
Pierce street	New Jersey avenue	North Capitol street.	32	5, 535						
Pierce street	Fourteenth street north-west.	Fifteenth street north-west.	30	2, 154						
Ridge street	Fourth street northwest	Fifth street northwest.	32	2, 518						
Riggs street	Thirteenth street north-west.	Fourteenth street north-west.	30	*2, 030						
Sanson street	Fourteenth street north-west.	Seventeenth street north-west.	24	4, 408						
School street	Four-and-a-half street south-west.	Sixth street southwest.	34				2, 346			
Sherman street	Eighteenth street north-west.	Nineteenth street north-west.	20						1, 046	
Sunderland place	New Hampshire avenue	do	30	*1, 186						
Union street	M street south	O street south	40				5, 353			
Washington street	Fourth street west	Fifth street west	35	2, 128						
Wallach Place	Thirteenth street west	Fourteenth street west	30	*2, 075						
Warner street	Fifth street west	New Jersey avenue	30						1, 000	
Water street	Seventh street west	Twelfth street west	50		16, 558					
Do	Twelfth street	Thirteenth and-a-half street west.	50		*2, 627					9, 729

GEORGETOWN.

[illegible]

Character and extent of street pavements, July 1, 1890—Continued.

GEORGETOWN—Continued.

[Streets marked thus * have been paved since July 1, 1888.]

Street.	From—	To—	Carriage way.						Remarks.
			Width.	Asphalt or concrete.	Granite.	Wood.	Cobble and blue rock.	Macadam.	
			Feet.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Sq. yds.	Unimproved.
Thirtieth street.....	P street.....	Q street.....	30	1,282					
Do.....	Q street.....	U street.....	30		*2,746				
Jefferson street.....	M street.....	Water street.....	32				2,839		O. c. walk, curb, and gutter.
Thirty-first street.....	do.....	do.....	30	*1,209			1,825		Do.
Do.....	do.....	P street.....	30	*3,933	*1,742				
Do.....	P street.....	U street.....	30	*1,832	*3,285				
Thirty-second street.....	M street.....	Water street.....	30				3,540		
Do.....	do.....	P street.....	35		*6,202				
Do.....	P street.....	U street.....	35				6,416		
Potomac street.....	M street.....	Canal.....	30				1,071		
Do.....	do.....	O street.....	30	*1,840	*1,053				
Thirty-third street.....	do.....	N street.....	30						
Do.....	P street.....	P street.....	30	*2,050					
Do.....	do.....	Thirty-second street.....	30	4,674					
Do.....	M street.....	Canal.....	30				1,071		
Thirty-fourth street.....	do.....	Thirty-second street.....	30	1,660					
Thirty-fifth street.....	M street.....	U street.....	35				975		11,074
Do.....	Prospect street.....	P street.....	35	11,253					1,560
Thirty-sixth street.....	do.....	do.....	30						3,166
Thirty-seventh street.....	M street.....	do.....	30						4,167
Mill street.....	P street.....	North street.....	30						
Grace street.....	Potomac street.....	Thirty-second street.....	30					1,500	East side improved.
North street.....	P street.....	Mill street.....	29		1,928				1,500

Character and extent of street pavements July 1, 1890—Continued.

SUMMARY STATEMENT.

Carriage way.	Length, feet.	Area, sq. yards.	Miles.
Sheet asphalt	228,168	956,794	43.2
Coal tar	201,640	881,939	38.2
Asphalt block	45,254	200,103	8.6
Granite block	124,449	578,715	23.5
Wood	1,553	5,611	0.3
Cobble and blue rock	60,536	452,614	11.5
Macadam	42,278	270,320	8.0
Gravel	155,374	591,418	29.4
Total improved	859,252	3,937,514	162.7
Unimproved	380,116	1,272,695	71.9
Grand total	1,239,368	5,210,209	234.6

SUBURBAN STREETS.

Location.	Width.	Asphalt.	Granite block.	Macadam.	Gravel.
	<i>Feet.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>	<i>Sq. yds.</i>
Fourteenth street extended from Boundary north	56	7,365			
Brightwood avenue from Grant avenue to Irving.	56		6,295		
Pomeroy street front of Freedman's Hospital	30	2,560			
Nichols avenue from Harrison avenue south	35		4,833		
Chapin street from Fourteenth to Fifteenth	30	2,185	674		
Stoughton street from Fourteenth to Fifteenth	30	1,583	755		
Eighteenth street extended from Boundary north	32				5,753
Sheridan street from Seventh to Ninth	30			2,660	
Massachusetts avenue extended from Boundary to Rock Creek	50			16,400	
Total		13,693	12,557	19,060	5,753

List of inspectors on sewer work.

[Rates under \$3 per diem are compensation of subinspectors.]

Name.	Compensation per diem.	Amount paid.	Under contracts.	Paid from appropriation for—
D. E. McComb*	†\$200.00	\$400.00	General services	Cleaning and repairing sewers and basins.
L. P. Bradshaw	4.00	544.00		Do.
H. M. Woodward	4.00	144.00		Do.
J. F. Onlahan	3.00	879.00		Do.
J. N. Oliver, Jr.	3.00	447.00		Do.
S. W. Mclson	2.50	582.50		Do.
C. Bailey	2.50	132.50		Do.
William J. W. Grey	2.50	67.50		Do.
J. G. Larnner	3.20	292.80	Sewer tapper	Do.
W. H. Simpson	3.20	958.40	do	Do.
F. Simpson	2.00	220.00	Assistant sewer tapper.	Do.
		4,667.70		
D. E. McComb*	†200.00	200.00		Replacing obstructed sewers.
S. A. H. Marks	4.00	24.00	1183	Do.
R. H. Lamb	4.00	36.00	1183	Do.
		260.00		
D. E. McComb*	†200.00	600.00		Construction of suburban sewers.
C. B. Ball	4.80	290.40		Do.

*Superintendent in charge of construction, repair, and maintenance of sewers. †Per month.

List of inspectors on sewer work—Continued.

[Rates under \$3 per diem are compensation of subinspectors.]

Name.	Compensation per diem.	Amount paid.	Under contracts.	Paid from appropriation for—
G. W. Wallace	\$2.50	\$87.50	.....	Construction of suburban sewers.
F. Hamlink	2.00	72.00	.....	Do.
M. E. Ward	4.00	320.00	.....	Do.
H. D. Mankin	2.00	160.00	.....	Do.
John Zug	2.00	192.00	.....	Do.
W. R. Reynolds	2.00	44.00	.....	Do.
G. W. Jackson	4.00	268.00	.....	Do.
J. R. Elder	2.00	124.00	.....	Do.
F. N. Chase	2.00	158.00	.....	Do.
L. T. Boisseau	4.75	247.00	.....	Do.
H. M. Woodward	4.00	216.00	.....	Do.
J. F. Onlahan	3.00	75.00	.....	Do.
J. N. Oliver, jr	3.00	198.00	.....	Do.
S. W. Melson	2.50	187.50	.....	Do.
C. Bailey	2.50	582.50	.....	Do.
William J. W. Grey	2.50	582.50	.....	Do.
H. C. Addison	4.00	60.00	1183	Do.
C. T. Curtis	4.00	708.00	1182, 1197, 1171	Do.
M. McNamara	{ 3.00?	285.00	1182, 1202	Do.
J. L. Venable	{ 4.00?	284.00	1202	Do.
S. A. H. Marks	4.00	30.00	1195, 1170	Do.
J. A. Breen	4.00	20.00	1171	Do.
R. H. Lamb	4.00	48.00	1183	Do.
B. F. Beach	{ 3.00?	380.00	1195, 1197	Do.
	{ 4.00?			
		6,219.40		
D. E. McComb*	†200.00	1,200.00	General services	Main and pipe sewers.
C. B. Ball	4.80	1,339.20	.....	Do.
G. W. Wallace	2.50	747.50	.....	Do.
F. Hamlink	2.00	518.00	.....	Do.
M. E. Ward	4.00	732.00	.....	Do.
John Zug	2.00	250.00	.....	Do.
H. D. Mankin	2.00	200.00	.....	Do.
W. R. Reynolds	2.00	84.00	.....	Do.
G. W. Jackson	4.00	132.00	.....	Do.
F. N. Chase	2.00	120.00	.....	Do.
J. R. Elder	2.00	42.00	.....	Do.
Edward Nervis	4.00	96.00	.....	Do.
S. A. H. Marks	4.00	898.00	1170, 1169, 1183, 1195, 1225	Do.
J. G. Lerner	4.00	4.00	954	Do.
H. C. Addison	4.00	440.00	1171	Do.
J. A. Breen	4.00	84.00	1171	Do.
C. T. Curtis	4.00	292.00	1169, 1171, 1225	Do.
M. McNamara	3.00	15.00	1169	Do.
B. F. Beach	{ 3.00?	529.00	1195, 1170, 1171, 1197	Do.
R. H. Lamb	{ 4.00?	776.00	1183, 1171	Do.
J. L. Venable	4.00	900.00	954, 1171, 1202	Do.
William J. W. Grey	2.50	130.00	.....	Do.
C. Bailey	2.50	67.50	.....	Do.
		9,596.20		
M. E. Ward	4.00	208.00	.....	Permit work.
H. D. Mankin	2.00	104.00	.....	Do.
John Zug	2.00	104.00	.....	Do.
A. M. Lambeth	3.85	1,001.00	.....	Do.
		1,417.00		
C. T. Curtis	4.00	92.00	.....	Deposit of Washington and Georgetown R. R. Co.
Do.	4.00	40.00	.....	Deposit of A. T. Britton and C. J. Bell, trustees.
		132.00		
		22,292.30		

* Superintendent in charge of construction, repair, and maintenance of sewers. †Per month.

List of inspectors on surface work.

Name.	Days.	Per day.	Amount paid.	Paid from appropriation for—
P. Reilley.....	286	\$5.00	\$1,430.00	Repairs to concrete pavements, 1890.
J. E. A. Maroney.....	155	3.50	542.50	Do.
Geo. W. Beall.....	285	4.00	1,140.00	Do.
W. J. White.....	39	3.00	117.00	Do.
Edw. Nervis.....	{ 52	3.00	428.00	Do.
	{ 64	4.00		
R. H. Parker.....	105	1.75	183.75	Do.
J. T. Harris.....	27	1.50	40.50	Do.
E. P. Hickey.....	{ 39	4.00	250.50	Do.
	{ 21	4.50		
J. H. Tinscher.....	11	4.00	44.00	Do.
J. N. Quackenbush.....	46	4.00	184.00	Do.
Wm. Welsh.....	15	4.00	60.00	Do.
W. H. O'Connor.....	25	3.00	75.00	Do.
E. Y. Beggs.....	285	7.00	1,995.00	Improvements and repairs to streets, avenues, etc., 1890.
J. H. Tinscher.....	160	4.00	640.00	Do.
A. G. McKeenzie.....	39	4.00	156.00	Do.
J. N. Quackenbush.....	204	4.00	816.00	Do.
J. N. Clarkson.....	263	4.00	992.00	Do.
J. L. Calhoun.....	207	4.00	828.00	Do.
Thos. McMahon.....	277	4.00	1,118.00	Do.
Wm. Welsh.....	262	4.00	1,048.00	Do.
W. E. Burton.....	{ 123	3.00	1,121.00	Do.
	{ 188	4.00		
R. McMurray.....	{ 52	3.50	874.00	Do.
	{ 173	4.00		
F. Reeside.....	{ 136	3.00	988.00	Do.
	{ 145	4.00		
J. E. Wills.....	99	3.00	297.00	Do.
E. P. Hickey.....	{ 52	4.00	487.00	Do.
	{ 62	4.50		
F. A. Benter.....	143	3.50	500.50	Do.
J. R. Howard.....	271	4.00	1,084.00	Do.
J. F. Patterson.....	140	1.50	210.00	Do.
W. H. Mitchell.....	{ 8	2.00	313.00	Do.
	{ 198	1.50		
L. T. Boisseau.....	206	4.75	978.50	Do.
W. H. Voss.....	285	3.00	855.00	Do.
Geo. Grey.....	{ 163	1.35	388.05	Do.
	{ 112	1.50		
Wm. Donaldson.....	281	4.00	1,124.00	Do.
E. H. Berry.....	{ 90	1.50	720.00	Do.
	{ 193	3.00		
Wm. Brown.....	157	4.00	628.00	Do.
J. E. Payne.....	273	2.50	682.50	Do.
Jos. Van Fleet.....	134	2.50	335.00	Do.
A. T. Batts.....	{ 173	1.35	401.50	Do.
	{ 112	1.50		
	{ 25	2.00		
J. M. Murphy.....	103	3.00	655.00	Do.
	{ 74	4.00		
J. A. E. Maroney.....	{ 27	3.00	441.50	Do.
	{ 103	3.50		
G. F. Brackett.....	58	2.00	116.00	Do.
J. W. Dudley.....	44	4.50	198.00	Do.
D. C. Haywood.....	99	1.50	148.50	Do.
J. T. Harris.....	25	1.50	37.50	Do.
L. G. Stanhope.....	153	4.00	612.00	Do.
E. Nervis.....	106	4.00	424.00	Do.
W. H. O'Connor.....	155	3.00	465.00	Do.
R. H. Parker.....	155	1.75	271.25	Do.
C. R. Unger.....	127	4.00	508.00	Do.
Walter Webb.....	103	1.50	154.50	Do.
M. T. Server.....	85	2.00	170.00	Do.
C. E. Pelz.....	{ 27	1.50	354.50	Do.
	{ 267	2.00		
	{ 193	2.00		
O. W. Brown.....	{ 59	3.00	695.00	Do.
	{ 33	4.00		
W. P. Cuff.....	74	2.00	148.00	Do.
H. N. Simpson.....	52	2.00	104.00	Do.
Henry Naylor.....	25	4.00	100.00	Do.
E. M. Talcott.....	160	4.00	640.00	Do.
R. D. Simms.....	300	4.00	1,200.00	Current repairs to county roads, 1890.
L. G. Stanhope.....	106	4.00	424.00	Electric lighting.
Total.....			27,446.80	

238 ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA.

Amounts paid for inspection and incidentals for year ending June 30, 1890.

Location.	Amount.	Total.	Remarks.
General schedule.....	\$5,771.86		
Georgetown schedule.....	2,016.57		
Northwest schedule.....	8,212.83		
Southwest schedule.....	3,854.20		
Southeast schedule.....	3,574.05		
Northeast.....	3,219.09		
Special.....	443.87		
		\$27,091.97	
Pennsylvania avenue extended.....	952.12		Suburban.
Fourth street east extended.....	607.44		Do.
Canal road.....	679.22		Do.
Fourteenth street extended.....	100.00		Do.
Pomeroy street.....	36.00		Do.
Eighteenth street extended.....	819.85		Do.
Massachusetts avenue extended.....	2,040.22		Do.
Sheridan street.....	189.97		Do.
Brightwood avenue.....	76.00		Do.
Bunker Hill road.....	238.29		Do.
		5,630.11	
Total.....		32,722.08	

LIST OF INSPECTORS, WATER DEPARTMENT, ENGAGED ON MANUFACTURE OF CAST-IRON PIPE.

List of inspectors employed in the distribution branch, water department, during fiscal year ending June 30, 1890.

Name.	Work.	Days.	Per day.	Amount.	From what appropriation.
W. R. Conard.....	Inspector on cast-iron pipe.	80½	\$3.00	\$241.50	Pumping expenses and pipe distribution.
Wm. Conard.....	do.....	17	3.00	51.00	Do.
Total.....				292.50	

LIST OF INSPECTORS REPORTED BY SUPERINTENDENT OF STREETS (SURFACE WORK).

List of inspectors employed in the District of Columbia during the fiscal year ending June 30, 1890, reported by the superintendent of streets.

Name.	Work.	Days.	Rate per day.	Amount.	From what appropriation.
A. D. Raymond.....	Inspector.....	54	\$3.00	\$162.00	Current repairs to streets, etc.
W. H. O'Connor.....	do.....	153	3.00	471.00	Do.
E. D. Tracy.....	do.....	258	4.00	1,032.00	Do.
W. J. Butler.....	do.....	17	2.00	34.00	Do.
H. D. Mankin.....	do.....	19	2.00	38.00	Do.
Alfred Cook.....	do.....	71	2.00	142.00	Do.
L. T. Boisseau.....	do.....	25	4.75	118.75	Do.
D. M. Cridler.....	do.....	283	3.85	1,089.55	Permit work.
J. H. McCormick.....	do.....	282	3.85	1,085.70	Do.
J. W. Bridger.....	do.....	27	2.50	67.50	Do.
G. F. Brackett.....	do.....	153	2.00	306.00	Do.
Edward Morris.....	do.....	258	2.50	645.00	Do.
A. M. Lambeth.....	do.....	26	3.85	100.10	Do.

LIST OF INSPECTORS PAID FROM STREET LIGHTING APPROPRIATIONS.

List of inspectors for fiscal year ending June 30, 1890, paid from appropriation for street lighting.

Name.	Work.	Days.	Per day.	Amount.	From what appropriation.
A. G. McKenzie	Inspector	2	\$4.00	\$8 00	Street lighting, 1889-'90.
L. G. Stanhope	do	79	4.00	316.00	Do.
Total.....	.....			324.00	

Tabulated statement showing the estimates and appropriations

	1880.		1881.	
	Estimated.	Appropriated.	Estimated.	Appropriated.
SALARIES AND CONTINGENT.				
Executive office.....	\$21,000.00	\$21,000.00	\$22,140.00	\$22,140.00
Markets.....				
Assessor's office.....	23,500.00	20,350.00	27,800.00	27,290.00
Collector's office.....	15,000.00	13,800.00	11,500.00	11,500.00
Auditor's office.....	19,000.00	19,000.00	13,000.00	13,000.00
Attorney's office.....	10,000.00	9,000.00	9,000.00	9,000.00
Sinking fund.....	2,700.00	2,700.00	2,700.00	2,700.00
Coroner's office.....	2,500.00	2,500.00	2,050.00	2,450.00
Engineer's office.....	86,735.00	81,700.00	73,086.00	72,306.00
Engineer department, sewer division.....				
Contingent expenses stable, engineer department.....				
Miscellaneous expenses, District offices.....	3,000.00	3,000.00	3,500.00	3,500.00
Expenses of assessment of real property.....				
Total salaries and contingent.....	183,435.00	173,050.00	165,376.00	166,796.00
IMPROVEMENTS AND REPAIRS.				
Repairs to concrete pavement.....	135,000.00	100,000.00	75,000.00	75,000.00
Material for permit work.....	15,000.00	15,000.00	20,000.00	20,000.00
Continuing surveys of the District.....			10,000.00	5,000.00
For sewers* main pipe.....		115,000.00	161,000.00	161,000.00
Work on streets and avenues.....	560,000.00	250,000.00	431,600.00	300,000.00
Grading streets, alleys, and roads.....				
Surveys on account of subdivisions of land.....				
Total improvements and repairs.....	710,000.00	480,000.00	697,600.00	561,000.00
Constructing and maintaining and repairing bridges.....	9,200.00	10,200.00	11,500.00	11,500.00
Washington Aqueduct.....	20,000.00	20,000.00	20,000.00	20,000.00
Redemption of certificates of indebtedness.....				
Sewer debt.....				
Total.....	29,200.00	30,200.00	31,500.00	31,500.00
REFORMATORIES AND PRISONS.				
Washington Asylum.....	45,000.00	45,100.00	38,200.00	48,040.00
Reform School.....	20,000.00	20,000.00	25,000.00	25,000.00
Georgetown almshouse.....	1,800.00	1,800.00	1,800.00	1,800.00
Transportation of paupers, etc.....	2,500.00	2,500.00	2,500.00	3,500.00
Industrial Home School.....		5,000.00		10,000.00
Support and transportation of convicts.....				
Total reformatories and prisons.....	69,300.00	74,400.00	67,500.00	88,340.00
Support of indigent insane.....	17,000.00	17,000.00	20,484.80	37,000.00
CHARITIES.				
Superintendent of Charities.....				
Temporary support of indigent persons, etc.....				
Relief of the poor, night lodging, etc.....	15,000.00	15,000.00	15,000.00	10,000.00
Columbia Hospital for Women.....		12,000.00		18,000.00
Women's Christian Association.....		5,000.00		5,000.00
Association for Destitute Colored Women and Children.....		6,500.00		6,500.00
Association for Destitute Colored Women and Children (building).....		5,000.00		5,000.00
Children's Hospital.....				5,000.00
Little Sisters of the Poor.....				5,000.00
German Orphan Asylum.....				10,000.00
Howard University.....		10,000.00		
St. Ann's Infant Asylum.....		5,000.00		5,000.00
Church Orphanage.....				
Homeopathic Hospital.....				
St. Rose Industrial School (buildings).....				
House of Good Shepherd (buildings).....				
Association for Works of Mercy (buildings).....				
Washington Hospital for Foundlings.....				
National Temperance Home.....				
Emergency Hospital.....				
Columbia Institute for Deaf and Dumb.....				
Total for charities.....	15,000.00	58,500.00	15,000.00	64,500.00

Eighty-five thousand dollars not expended.

ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA. 241

tions from 1880 to 1891, and estimates for 1892.

1882.		1883.		1884.		1885.	
Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.
\$22,140.00	\$22,140.00	\$23,314.04	\$21,200.11	\$21,600.11	\$21,101.50	\$21,581.50	\$21,244.00
27,000.00	17,500.00	23,600.00	17,500.00	19,400.00	12,600.00	13,500.00	13,600.00
13,900.00	10,000.00	13,500.00	13,500.00	13,500.00	17,300.00	17,300.00	17,300.00
12,800.00	12,800.00	12,900.00	12,900.00	12,750.00	15,200.00	16,500.00	16,643.00
9,000.00	8,812.00	9,000.00	8,812.00	8,812.00	8,812.00	8,792.00	8,612.00
2,700.00	2,700.00	3,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00
2,800.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
68,925.00	68,625.00	69,675.00	67,225.00	69,688.00	61,530.00	66,650.00	64,750.00
3,500.00	3,500.00	3,500.00	3,500.00	3,500.00	5,000.00	5,000.00	5,000.00
162,765.00	148,577.00	161,089.04	149,337.11	154,450.11	146,763.50	154,523.50	152,349.00
75,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
20,000.00	20,000.00	20,000.00	20,000.00	35,000.00	30,000.00	50,000.00	50,000.00
5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
132,000.00	72,000.00	155,000.00	105,000.00	98,000.00	95,000.00	100,000.00	100,000.00
320,364.03	300,000.00	273,000.00	300,000.00	315,685.61	350,000.00	300,000.00	263,000.00
552,364.03	447,000.00	503,000.00	480,000.00	503,685.61	530,000.00	505,000.00	468,000.00
2,500.00	2,500.00	12,700.00	12,700.00	3,500.00	3,500.00	2,500.00	2,500.00
20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	22,000.00	20,000.00
22,500.00	22,500.00	32,700.00	32,700.00	23,500.00	23,500.00	24,500.00	22,500.00
53,200.00	49,140.00	54,640.00	46,820.00	52,364.00	46,320.00	52,735.00	52,310.00
25,000.00	31,614.00	38,674.00	37,950.00	36,700.00	32,950.00	32,800.00	32,916.00
1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00	1,800.00
3,500.00	3,000.00	3,500.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00
5,000.00	10,500.00	5,000.00	5,000.00	5,000.00	10,000.00	15,000.00	12,500.00
88,500.00	96,054.00	103,614.00	94,570.00	98,864.00	94,070.00	105,335.00	102,526.00
37,000.00	40,000.00	40,000.00	40,200.00	40,200.00	46,700.00	46,700.00	50,436.00
15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
15,000.00	15,800.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00
	5,000.00		5,000.00				5,000.00
	6,500.00		6,500.00		7,000.00		7,000.00
					20,000.00		2,000.00
5,000.00	5,000.00		5,000.00		5,000.00		5,000.00
			5,000.00				
5,000.00	5,000.00		5,000.00		5,000.00		5,000.00
					1,500.00		1,500.00
40,000.00	52,300.00	30,900.00	56,500.00	30,000.00	73,500.00	30,000.00	55,500.00

Tabulated statement showing the estimates and appropriations.

	1880.		1881.	
	Estimated.	Appropriated.	Estimated.	Appropriated.
FOR STREETS.				
Gauging sewers and rain-fall.....				
Sweeping, cleaning, etc., streets, avenues, and alleys.....	\$42,600.00	\$42,600.00	\$43,600.00	\$43,600.00
Current repair of streets, avenues, and alleys.....	75,500.00	75,500.00	105,000.00	85,000.00
Constructing county roads and suburban streets.....				
Current work on county roads, etc.....				
Cleaning sewers and basins.....		10,000.00	3,000.00	3,000.00
For preparation of plans for sewage disposal.....				
For replacing obstructed sewers.....				
For constructing suburban sewers.....				
Repairs to pumps.....	2,500.00	2,500.00	3,000.00	3,000.00
Parking commission.....	13,400.00	13,400.00	13,400.00	13,400.00
Lighting streets, avenues, and alleys.....	140,000.00	130,370.00	123,470.00	123,400.00
Opening and extending suburban streets.....				
For condemnation of rights of way.....				
Maintenance and repair of sewers.....				
For constructing cement house.....				
Total streets.....	274,000.00	274,370.00	291,470.00	271,400.00
Metropolitan police.....	300,000.00	305,240.00	300,000.00	300,120.00
Fire department.....	115,000.00	105,700.00	105,000.00	104,240.00
Telegraph and telephone service.....				
Court.....	18,500.00	18,500.00	18,938.00	18,818.00
Courts, police magistrates.....				
Total.....	483,500.00	429,440.00	423,938.00	423,178.00
FOR PUBLIC SCHOOLS.				
Tools and machinery for industrial instruction.....				
Officers.....				
Teachers.....				
Eight supervising principals.....	311,412.63	311,412.63	308,000.00	327,834.80
Night schools.....				
Contingent expenses, night schools.....				
Janitors, care of building.....				
Rent of school buildings.....	30,000.00	30,000.00	35,000.00	30,000.00
Fuel.....	12,000.00	12,000.00	12,000.00	12,000.00
Repairs and improvements.....	25,000.00	25,000.00	20,000.00	16,000.00
Contingent expenses, furniture, etc.....	21,587.37	21,587.37	25,000.00	20,000.00
Purchase of sites, new buildings, and furniture.....		75,000.00		100,000.00
Sanitary improvements in old buildings.....				
Total public schools.....	400,000.00	475,000.00	400,000.00	504,834.80
MISCELLANEOUS EXPENSES.				
Repairs and replacement of hay scales.....	200.00	200.00	500.00	200.00
Rent of District offices.....	6,000.00	6,000.00	3,000.00	3,000.00
General advertising.....	7,000.00	7,000.00	7,000.00	7,000.00
Books for register of wills, printing, etc.....	6,500.00	6,500.00	6,798.07	6,798.07
Total miscellaneous.....	19,700.00	19,700.00	17,598.07	17,598.07
Interest and sinking fund.....	1,216,124.12	1,155,583.55	1,155,583.55	1,155,583.55
General contingent fund for emergencies.....		20,000.00	50,000.00	20,000.00
Municipal buildings.....				
For the payment of judgments against the District of Columbia.....				2,704.20
Health department.....	32,355.00	34,755.00	36,548.34	35,565.00
District militia.....				
Total.....	1,248,479.12	1,210,338.55	1,242,131.89	1,213,852.75
Rent of market site and property yard.....		1,175.00		
Revision of laws.....		5,000.00		
Purchase of police court building.....				20,000.00
Removal of bodies from Holmead Cemetery.....				2,000.00
Condemnation of land for alleys, streets, and roads.....				24,497.73
Payment of Linthicum loan (school).....				
Repair of Georgetown market house.....				

* Includes macadam repairs whenever appropriated.

† Includes \$16,732 for land and improvement of Fourteenth street extended.

‡ Includes \$10,000 for dredging James Creek Canal.

§ Includes fuel, furniture, stationery, repairs, etc.

Tabulated statement showing the estimates and appropria

	1880.		1881.	
	Estimated.	Appropriated.	Estimated.	Appropriated.
MISCELLANEOUS EXPENSES—continued.				
Payment of referees of Court of Claims, necessary expenses, etc				
Designation of alleys and numbering houses in suburban villages				
Total		\$6,175.00		\$49,497.73
WATER DEPARTMENT.				
Salaries and contingent expenses				
For engineers, firemen, pipe distribution, etc				
Interest and sinking fund on water-stock bonds				
Interest and sinking fund on account of water supply				
Purchase of pump house on U street northwest				
Water main to Anacostia, D. C				
Water main to Mount Pleasant				
Water main on 14th street, K north to B south				
Total water department				
Two pumping engines, etc				
Improvement and protection of harbor, etc				
Board of examiners of steam engineers				
Zoological park				
Total				

During the fiscal year 1884-'85, \$500,000 was appropriated towards completing the sewerage system

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tions for 1880 to 1881, and estimates for 1892—Continued.

1882.		1883.		1884.		1885.	
Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.
	\$2,000.00						
	46,000.00		\$1,000.00				
		\$14,139.00	11,739.00	\$11,842.00	\$11,742.00	\$11,742.00	\$11,739.00
		52,301.50	55,101.50	50,000.00	51,251.50	130,000.00	100,000.00
		44,610.00	44,610.00	44,610.00	44,610.00	44,610.00	44,610.00
							30,000.00
		111,050.50	111,450.50	106,452.00	107,603.50	186,352.00	186,349.00

of the District of Columbia, but was not included in the regular appropriation bill.

Tabulated statement showing the estimates and appropriations

	1886.		1887.	
	Estimated.	Appropriated.	Estimated.	Appropriated.
SALARIES AND CONTINGENT.				
Executive office.....	\$21,244.00	\$21,244.00	\$21,844.00	\$22,444.00
Markets.....				
Assessor's office.....	13,600.00	13,600.00	15,600.00	14,000.00
Collector's office.....	17,300.00	17,300.00	18,500.00	19,200.00
Auditor's office.....	16,500.00	16,500.00	16,500.00	16,500.00
Attorney's office.....	8,712.00	8,712.00	9,000.00	8,700.00
Sinking fund.....	2,700.00	2,700.00	2,100.00	2,700.00
Coroner's office.....	2,500.00	2,500.00	2,500.00	2,500.00
Engineer's office.....	65,490.00	65,690.00	75,450.00	65,690.00
Engineer's department, sewer division.....				
Contingent expenses stable, engineer department.....				
Miscellaneous expenses, District offices.....	5,000.00	5,000.00	5,000.00	5,000.00
Expenses of assessment of real property.....		15,000.00		
Total salaries and contingent.....	153,046.00	168,246.00	167,494.00	157,334.00
IMPROVEMENTS AND REPAIRS.				
Repairs to concrete pavement.....	50,000.00	50,000.00	75,000.00	65,000.00
Material for permit work.....	50,000.00	50,000.00	50,000.00	60,000.00
Continuing surveys of the District.....	5,000.00	5,000.00	5,000.00	4,000.00
For sewers' main pipe.....	25,000.00	25,000.00	75,000.00	45,000.00
Work on streets and avenues.....	325,000.00	265,000.00	325,000.00	260,000.00
Grading streets, alleys, and roads.....				
Surveys on account of subdivisions of land.....				
Total improvements and repairs.....	455,000.00	395,000.00	530,000.00	440,000.00
Constructing and maintaining and repairing bridges.....	8,000.00	9,380.00	7,000.00	12,600.00
Washington Aqueduct.....	20,000.00	20,000.00	20,000.00	20,000.00
Redemption of certificates of indebtedness.....		366.96		
Sewer debt.....	50,000.00			
Total.....	78,000.00	29,746.96	27,000.00	32,600.00
REFORMATORIES AND PRISONS.				
Washington Asylum.....	69,680.00	69,680.00	56,690.00	57,382.00
Reform School.....	36,640.00	36,616.00	36,676.00	36,616.00
Georgetown Almshouse.....	1,800.00	1,800.00	1,800.00	1,800.00
Transportation of paupers, etc.....	4,000.00	4,000.00	4,000.00	4,000.00
Industrial Home School.....	13,500.00	12,000.00	12,000.00	13,500.00
Support and transportation of convicts.....				
Total reformatories and prisons.....	125,620.00	124,096.00	111,166.00	113,298.00
Support of indigent insane.....	51,446.00	53,462.00	53,462.00	75,132.00
CHARITIES.				
Superintendent of charities.....				
Temporary support of indigent persons, etc.....				
Relief of the poor, night lodging, etc.....	15,000.00	15,000.00	15,000.00	15,000.00
Columbia Hospital for Women.....	15,000.00	15,000.00	15,000.00	15,000.00
Women's Christian Association.....		5,000.00		4,000.00
Association for Destitute Colored Women and Children.....		6,500.00		6,500.00
Association for Destitute Colored Women and Children (building).....		18,000.00		2,500.00
Children's Hospital.....		5,000.00		5,000.00
Little Sisters of the Poor.....				
German Orphan Asylum.....				
Howard University.....				
St. Ann's Infant Asylum.....		5,000.00		5,000.00
Church Orphanage.....		15,000.00		5,000.00
Homeopathic Hospital.....				5,000.00
St. Rose Industrial School (buildings).....				5,000.00
House of Good Shepherd (buildings).....				5,000.00
Association for Works of Mercy (buildings).....				5,000.00
Washington Hospital for Foundlings.....				3,555.00
National Temperance Home.....				
Emergency Hospital.....				
Columbia Institute for Deaf and Dumb.....				
Total for charities.....	30,000.00	86,000.00	30,000.00	78,000.00

* Eighty-five thousand dollars not expended.

from 1880 to 1891, and estimates for 1892—Continued.

1888.		1889.		1890.		1891.		1892.
Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.
\$22,784.00	\$22,844.00	\$23,284.00	\$43,064.00	\$45,543.00	\$44,577.00	\$45,977.00	\$45,607.00	\$68,577.00
4,100.00	4,100.00	5,350.00	5,000.00	5,000.00	4,600.00	5,100.00	4,500.00	3,600.00
16,500.00	16,300.00	16,900.00	17,300.00	18,900.00	18,300.00	18,500.00	21,400.00	36,880.00
16,800.00	16,500.00	17,800.00	22,400.00	20,700.00	19,950.00	22,200.00	20,450.00	16,200.00
16,900.00	16,500.00	16,550.00	16,500.00	16,500.00	16,500.00	16,700.00	16,500.00	16,200.00
9,800.00	9,000.00	10,700.00	11,600.00	12,600.00	11,600.00	11,600.00	11,600.00	11,200.00
2,700.00	2,700.00	3,300.00	2,700.00	3,300.00	2,700.00	2,700.00	2,650.00	2,400.00
2,650.00	2,650.00	2,800.00	2,800.00	2,800.00	2,800.00	3,100.00	2,950.00	3,100.00
64,820.00	61,190.00	95,235.00	45,650.00	65,465.00	45,150.00	49,950.00	40,150.00	45,700.00
7,500.00	6,700.00	7,000.00	7,000.00	8,000.00	7,000.00	8,000.00	7,000.00	23,297.00
160,254.00	158,584.00	198,919.00	189,014.00	198,808.00	173,177.00	183,827.00	178,807.00	233,154.00
90,000.00	80,000.00	100,000.00	95,000.00	230,000.00	215,000.00	100,000.00	120,000.00	135,000.00
90,000.00	90,000.00	100,000.00	90,000.00	200,000.00	125,000.00	200,000.00	215,000.00	165,000.00
15,000.00	4,000.00	10,000.00	10,000.00	5,000.00	15,000.00	10,000.00	7,600.00	119,500.00
105,000.00	50,000.00	75,000.00	70,000.00	150,000.00	90,000.00	125,000.00	140,000.00	344,600.00
405,000.00	360,000.00	805,919.03	615,000.00	1,079,804.00	772,000.00	650,000.00	652,200.00	20,000.00
705,000.00	574,000.00	1,100,919.03	895,000.00	1,679,804.00	1,237,000.00	1,115,000.00	1,159,800.00	789,100.00
13,500.00	12,000.00	27,000.00	17,000.00	15,900.00	13,400.00	25,000.00	25,000.00	20,000.00
20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00	25,500.00	20,000.00
33,500.00	32,000.00	47,000.00	37,000.00	35,900.00	33,400.00	45,000.00	50,500.00	40,000.00
50,555.00	53,305.00	61,655.00	56,815.00	55,915.00	53,415.00	100,250.00	89,315.00	98,875.00
37,976.00	47,170.00	44,946.00	44,246.00	47,596.00	39,896.00	54,232.00	39,696.00	44,396.00
1,800.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00
10,000.00	10,000.00	11,500.00	11,000.00	11,000.00	17,200.00	15,000.00	14,000.00	13,500.00
133,331.00	114,475.00	110,601.00	116,561.00	118,511.00	114,511.00	173,482.00	147,611.00	181,771.00
75,132.00	75,132.00	79,185.00	79,185.00	85,000.00	85,000.00	87,500.00	87,500.00	90,570.00
15,000.00	15,000.00	17,500.00	15,960.00	16,000.00	16,000.00	16,000.00	16,000.00	16,000.00
4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,000.00	4,500.00	4,000.00	4,000.00
7,000.00	10,000.00	10,000.00	10,700.00	12,000.00	12,000.00	12,000.00	12,000.00	12,000.00
5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	10,000.00	10,000.00
6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,000.00	6,500.00	6,500.00
7,500.00	7,500.00	7,500.00	7,500.00	7,500.00	7,500.00	7,500.00	7,500.00	7,500.00
2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00
5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00
3,500.00	3,500.00	3,500.00	3,500.00	3,500.00	3,500.00	3,500.00	3,500.00	3,500.00
2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00
10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
80,100.00	15,000.00	106,850.00	15,060.00	117,200.00	104,500.00	150,942.00	120,400.00	120,400.00

* Includes \$25,000 for contingent expenses for District offices.

* Includes purchase and survey of land at distributing reservoir.

Tabulated statement showing the estimates and appropriations,

	1886.		1887.	
	Estimated.	Appropriated.	Estimated.	Appropriated.
FOR STREETS.				
Gauging sewers and rainfall				
Sweeping, cleaning, etc., streets, avenues, and alleys	\$55,000.00	\$55,000.00	\$60,000.00	\$58,000.00
Current repair of streets, avenues, and alleys†	25,000.00	25,000.00	30,000.00	25,000.00
Constructing county roads and suburban streets				
Current work on county roads, etc.	40,000.00	40,000.00	45,000.00	40,000.00
Cleaning sewers and basins§	25,000.00	25,000.00	30,000.00	25,000.00
For preparation of plans for sewage disposal				
For replacing obstructed sewers				
For constructing suburban sewers				
Repairs to pumps	3,000.00	3,000.00	3,000.00	3,000.00
Parking commission	18,000.00	18,000.00	20,000.00	18,000.00
Lighting streets, avenues, and alleys	100,000.00	100,000.00	105,000.00	100,000.00
Opening and extending suburban streets				30,000.00
For condemnation of rights of way				
Maintenance and repair of sewers				
For constructing cement house				
Total streets	266,000.00	266,000.00	293,000.00	299,000.00
Metropolitan police	351,280.00	339,720.00	357,500.00	344,780.00
Fire department	112,300.00	108,150.00	115,950.00	116,420.00
Telegraph and telephone service	15,440.00	18,040.00	15,840.00	15,840.00
Court	16,218.00	16,218.00	16,218.00	16,218.00
Courts, police magistrates				
Total	495,238.00	482,128.00	505,508.00	493,258.00
FOR PUBLIC SCHOOLS.				
Tools and machinery for industrial instruction				
Officers	7,250.00	7,250.00	7,250.00	6,950.00
Teachers	385,000.00	390,000.00	400,000.00	415,400.00
Eight supervising principals				
Night schools				2,500.00
Contingent expenses, night schools				
Janitors, care of building	31,000.00	30,680.00	31,848.00	31,900.00
Rent of school buildings	7,000.00	7,000.00	6,000.00	6,000.00
Fuel	20,000.00	20,000.00	20,200.00	20,000.00
Repairs and improvements	20,000.00	20,000.00	25,000.00	20,000.00
Contingent expenses, furniture, etc. ||	20,000.00	20,000.00	25,000.00	25,000.00
Purchase of sites, new buildings, and furniture	60,000.00	60,000.00	20,000.00	50,000.00
Sanitary improvements in old buildings				
Total public schools	550,250.00	554,930.00	535,098.00	577,750.00
MISCELLANEOUS EXPENSES.				
Repairs and replacement of hay scales	500.00	500.00	500.00	500.00
Rent of District offices	3,600.00	3,600.00	3,600.00	3,600.00
General advertising	4,000.00	4,000.00	3,000.00	3,000.00
Books for register of wills, printing, etc.	2,500.00	2,500.00	2,500.00	2,500.00
Total miscellaneous	10,600.00	10,600.00	9,600.00	9,600.00
Interest and sinking fund	1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97
General contingent fund for emergencies	5,000.00	5,000.00	5,000.00	5,000.00
Municipal buildings			120,500.00	
For the payment of judgments against the District of Columbia				
Health department	36,400.00	44,130.00	46,400.00	42,280.00
District militia				
Total	1,255,347.97	1,263,077.97	1,390,347.97	1,261,227.97
Rent of market site and property yard				
Revision of laws				
Purchase of police court building				
Removal of bodies from Holmead Cemetery				
Condemnation of land for alleys, streets, and roads				
Payment of Linthicum loan (school)				
Repair of Georgetown market house				
Payment of referees of Court of Claims, necessary expenses, etc.				

† Includes macadam repairs whenever appropriated.

‡ Includes \$16,732 for land and improvement of Fourteenth street extended.

§ Includes \$10,000 for dredging James Creek Canal.

|| Includes fuel, furniture, stationery, repairs, etc.

from 1880 to 1891, and estimates for 1892—Continued.

1888.		1889.		1890.		1891.		1892.
Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.
						\$3,000.00	\$3,000.00	\$2,500.00
\$70,000.00	\$65,000.00	\$85,000.00	\$77,000.00	\$100,000.00	\$85,000.00	100,000.00	100,000.00	125,000.00
35,000.00	30,000.00	50,000.00	35,000.00	50,000.00	40,000.00	60,000.00	60,000.00	45,000.00
	50,000.00	78,000.00	88,980.00	198,000.00	135,525.00	204,450.00	178,950.00	78,000.00
50,000.00	25,000.00	54,000.00	45,000.00	60,000.00	50,000.00	75,000.00	60,000.00	60,000.00
35,000.00	30,000.00	35,000.00	30,000.00	35,000.00	35,000.00	42,000.00	42,000.00	45,000.00
		5,000.00	5,000.00			15,000.00		
	7,500.00	15,000.00	10,000.00	20,000.00	15,000.00	26,000.00	26,000.00	25,000.00
	35,000.00	35,000.00	35,000.00	70,000.00	50,000.00	75,000.00	75,000.00	112,390.00
3,000.00	3,000.00	5,000.00	4,000.00	4,000.00	4,000.00	5,000.00	5,000.00	5,000.00
25,000.00	18,000.00	23,000.00	18,000.00	25,000.00	18,000.00	18,000.00	18,000.00	20,000.00
120,000.00	120,000.00	140,000.00	135,000.00	160,000.00	155,000.00	\$176,000.00	\$171,000.00	189,000.00
60,000.00								
							10,000.00	15,000.00
							2,500.00	
398,000.00	338,500.00	525,000.00	482,980.00	722,000.00	602,525.00	784,450.00	736,450.00	721,890.00
417,280.00	350,560.00	503,860.00	406,540.00	413,900.00	467,640.00	566,835.00	522,435.00	529,423.00
114,420.00	109,920.00	175,050.00	141,200.00	136,890.00	136,390.00	163,520.00	\$166,820.00	143,870.00
28,060.00	23,340.00	43,520.00	17,800.00	21,800.00	16,800.00	20,800.00	28,800.00	20,800.00
20,074.00	13,724.00	16,218.00	16,518.00	19,418.00	16,518.00	18,518.00	22,818.00	19,418.00
		12,000.00						
579,834.00	497,544.00	750,648.00	582,058.00	592,008.00	637,348.00	769,673.00	740,873.00	713,511.00
5,000.00	5,000.00	10,000.00	8,000.00	12,000.00	10,000.00	10,000.00	10,000.00	12,000.00
7,500.00	6,950.00	7,750.00	7,450.00	7,750.00	7,450.00	7,450.00	7,450.00	8,350.00
492,675.00	438,270.00	464,310.00	466,810.00	510,325.00	506,600.00	544,575.00	544,575.00	578,800.00
16,000.00								
5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	6,000.00	6,000.50	6,000.00
500.00	300.00	500.00	500.00	500.00	500.00	600.00	600.00	600.00
33,200.00	34,400.00	41,400.00	37,711.00	42,886.00	41,811.00	46,476.00	44,826.00	50,286.00
9,000.00	15,000.00	15,000.00	15,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
20,000.00	20,000.00	20,000.00	25,000.00	25,000.00	24,000.00	30,000.00	27,000.00	29,000.00
25,000.00	20,000.00	30,000.00	35,000.00	20,000.00	20,000.00	25,000.00	\$25,175.00	27,500.00
25,000.00	20,000.00	20,000.00	22,500.00	25,000.00	25,000.00	25,000.00	25,000.00	27,500.00
100,000.00	238,000.00	261,500.00	336,000.00	306,000.00	314,985.30	298,925.00	275,750.00	296,500.00
15,000.00	10,000.00	5,000.00	3,000.00					
693,875.00	812,923.00	800,460.00	958,971.00	964,461.00	965,346.30	914,026.00	976,376.00	1,046,536.00
750.00	500.00	500.00	250.00	250.00	250.00	250.00	250.00	1,250.00
10,000.00	3,600.00	4,000.00	3,600.00	4,000.00	3,600.00	4,000.00	3,600.00	4,000.00
3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	9,000.00
2,500.00	1,500.00	1,200.00	1,200.00	1,200.00	1,200.00	526.12	800.00	
21,250.00	8,600.00	8,700.00	8,050.00	8,450.00	8,050.00	7,776.12	7,650.00	14,250.00
1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97	1,213,947.97
5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00
44,570.00	42,580.00	43,410.00	43,310.00	48,060.00	48,540.00	53,540.00	50,460.00	53,060.00
						35,000.00	23,220.00	35,620.00
1,263,517.97	1,261,527.97	1,262,357.97	1,262,257.97	1,267,007.07	1,267,487.97	1,307,487.97	1,292,627.97	1,307,627.97
			800.00	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00
							10,000.00	
		10,000.00	10,000.00	20,000.00	5,000.00	5,000.00	5,000.00	5,000.00
	2,500.00	2,500.00	2,500.00		2,500.00	2,500.00	2,500.00	2,500.00

³ Of which \$40,000 is for electric lighting.⁴ Of which \$46,000 is for electric lighting.⁵ Includes \$10,000 for expenses of electrical board.⁶ Includes \$3,175 for inclosing grounds of Arthur school building.

Tabulated statement showing the estimates and appropriations

	1886.		1887.	
	Estimated.	Appropriated.	Estimated.	Appropriated.
SALARIES AND CONTINGENT—Continued.				
Designation of alleys and numbering houses in suburban villages.....				
Total.....				
WATER DEPARTMENT.				
Salaries and contingent expenses.....	\$11,739.00	\$11,739.00	\$16,634.00	\$11,939.00
For engineers, firemen, pipe distribution, etc.....	78,000.00	78,000.00	65,000.00	75,000.00
Interest and sinking fund on water-stock bonds.....	44,610.00	44,610.00	44,610.00	44,610.00
Interest and sinking fund on account of water supply.....	55,047.27	55,047.27	57,239.02	57,239.02
Purchase of pump house on U street northwest.....				
Water main to Anacostia, D. C.....				
Water main to Mount Pleasant.....				
Water main on 14th street, K north to B south.....				
Total water department.....	189,396.27	189,396.27	183,483.02	188,788.02
Two pumping engines, etc.....				
Improvement and protection of harbor, etc.....				
Board of examiners of steam engineers.....				
Zoological park.....				
Total.....				

ENGINEER DEPARTMENT, DISTRICT OF COLUMBIA.

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from 1880 to 1891, and estimates for 1892—Continued.

1888.		1889.		1890.		1891.		1892.
Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.	Appropriated.	Estimated.
								\$1,000.00
	\$2,500.00	\$12,500.00	\$13,300.00	\$21,000.00	\$8,500.00	\$8,500.00	\$9,500.00	9,500.00
\$18,936.00	11,936.00	23,100.00	17,836.00	19,600.00	18,336.00	19,039.00	41,972.00	43,981.00
125,000.00	100,000.00	100,000.00	130,000.00	86,500.00	86,000.00	86,000.00	62,000.00	130,000.00
44,610.00	44,610.00	44,610.00	44,610.00	44,610.00	44,610.00	44,610.00	44,610.00	44,610.00
76,655.69	76,655.69	86,962.35	86,962.35	86,415.64	86,415.64	84,825.18	84,825.18	84,007.20
		2,275.00	2,275.00					
		2,500.00						
		7,500.00						
			31,000.00					
265,201.69	233,201.69	266,947.35	312,683.35	237,125.64	235,361.64	234,474.18	233,407.18	302,598.20
35,000.00	35,000.00							
10,000.00	2,500.00	8,700.00	2,500.00	2,500.00	2,500.00	4,000.00	3,500.00	3,500.00
				1,000.00		1,000.00	900.00	900.00
					200,000.00			
					202,500.00	5,000.00	4,400.00	4,400.00

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that proper record-keeping is essential for transparency and accountability, particularly in financial matters. The text suggests that organizations should implement robust systems to track every aspect of their operations, from procurement to sales.

2. The second section focuses on the role of technology in modern business management. It highlights how digital tools can streamline processes, reduce errors, and improve overall efficiency. The author argues that embracing technology is not just a competitive advantage but a necessity for long-term success in today's fast-paced market.

3. The third part of the document addresses the challenges of human resource management. It discusses the importance of attracting and retaining top talent, as well as the need for continuous training and development. The text suggests that organizations should create a supportive work environment that encourages innovation and growth.

4. The fourth section explores the impact of market trends and consumer behavior on business strategy. It notes that companies must stay attuned to changing market conditions and adapt their offerings accordingly. The author suggests that thorough market research and data analysis are crucial for making informed decisions.

5. The final part of the document provides a summary of key takeaways and offers practical advice for implementing the discussed concepts. It encourages organizations to adopt a proactive approach to management, regularly reviewing and refining their strategies to stay ahead of the competition.

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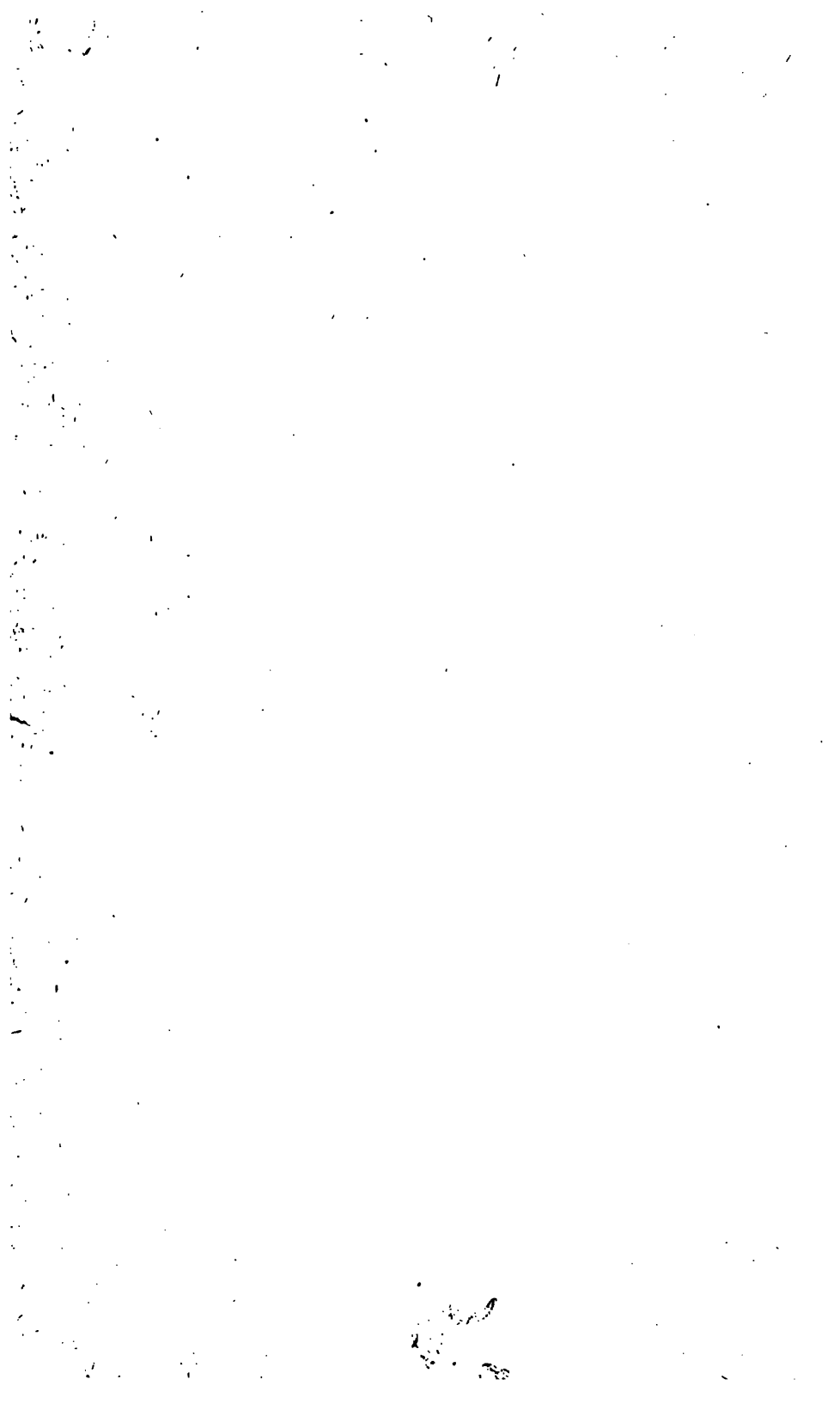
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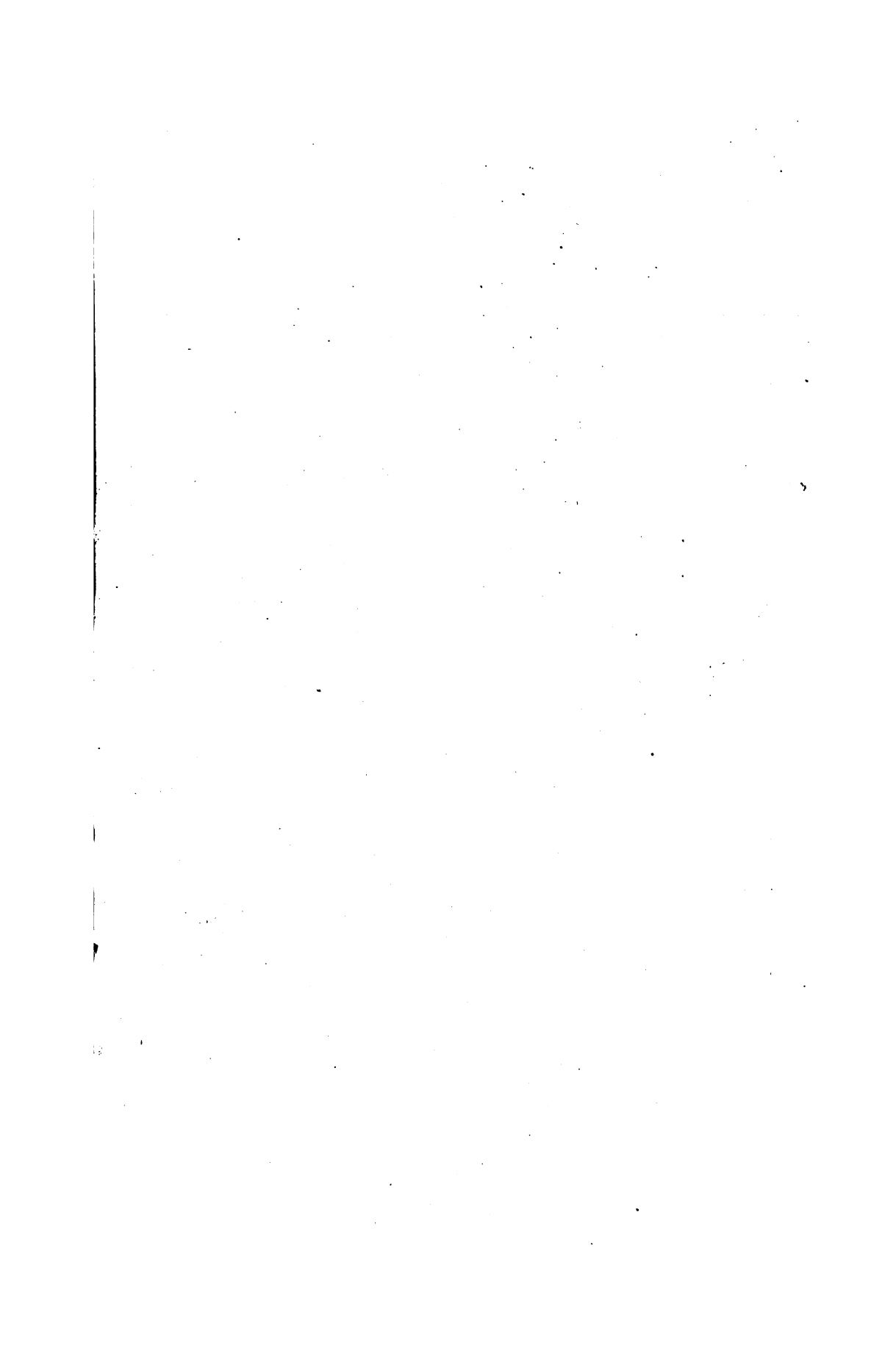
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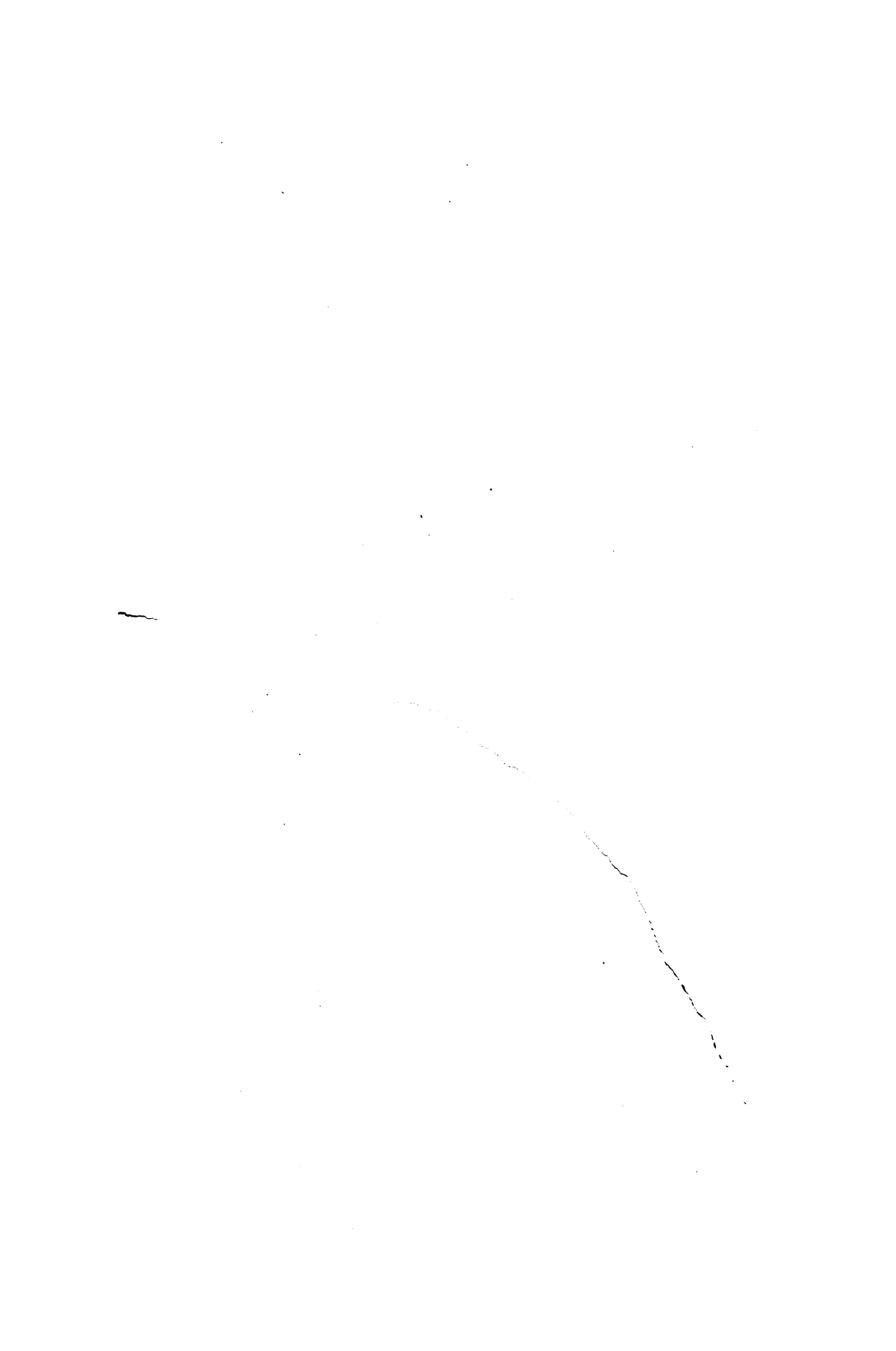
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